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HAZELTINE CORP GREENLAWN NY
METAL-GRID SPATIAL FILTER. VOLUME II.(U)

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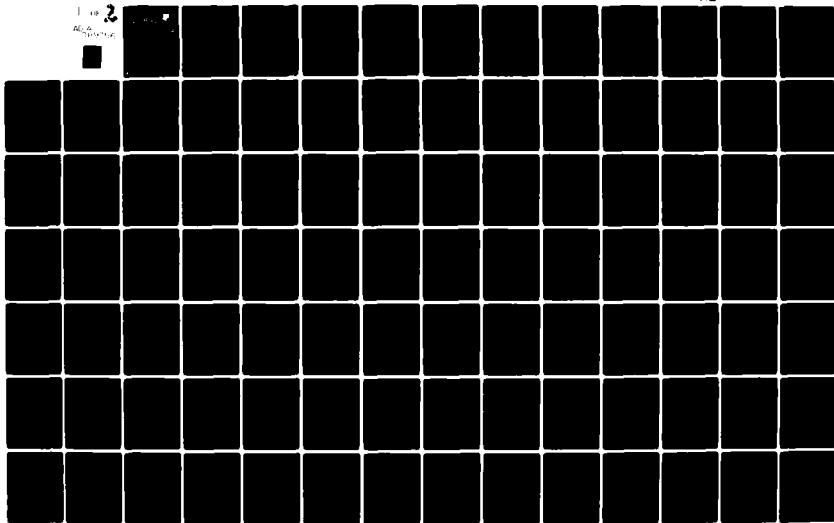
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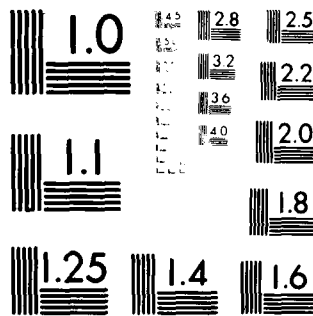
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RADC-TR-79-295, Vol II (of two)
Interim Technical Report
July 1980

LEVEL III

METAL-GRID SPATIAL FILTER

Hazeltine Corporation

P. W. Hannan
P. L. Burgmyer

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ELECTE
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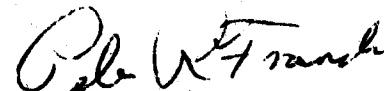
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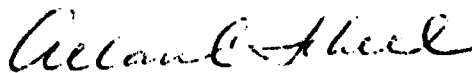
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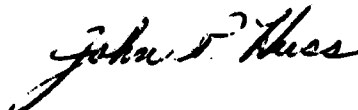
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FOR THE COMMANDER:



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Metal-Grid Spatial Filter Angular Filter	This interim report presents the results of studies relevant to the design of spatial filters that have metal grids as their basic reflecting element. An analysis of metal-grid spatial filter designs shows the performance that is available. An experimental investigation of various types of metal grids confirms their suitability for spatial filters.	

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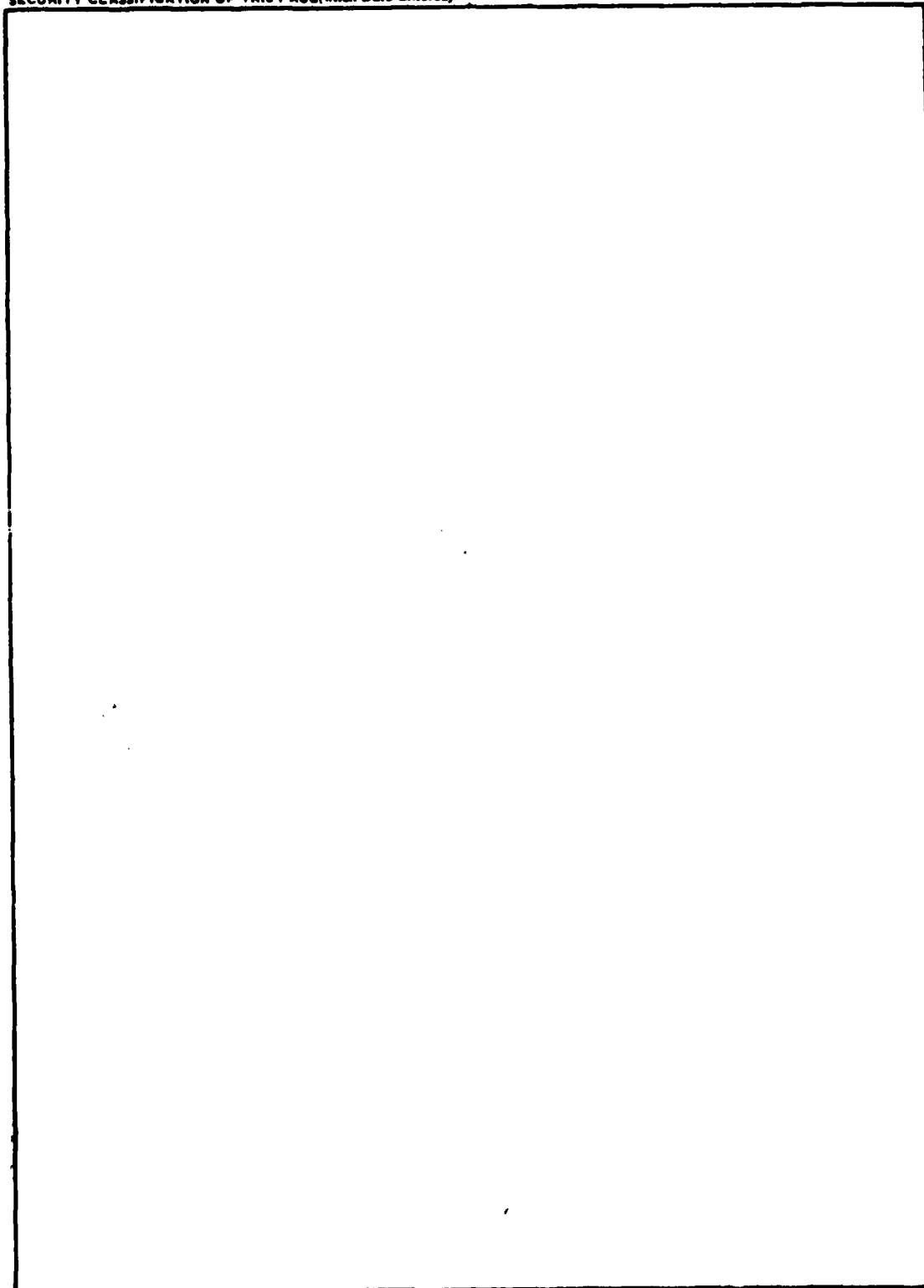
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TABLE A-1, Part 1 of 2
FILTER IDENTIFICATION CODE

<u>Filter Code</u>	<u>Passband Width (deg)</u>	<u>Quantity of Poles</u>	<u>Ripple (dB)</u>
A20	± 11.5	2	.1
A21	"	"	.01
A22	"	"	.001
B20	± 14.0	"	.1
B21	"	"	.01
B22	"	"	.001
C20	± 18.0	"	.1
C21	"	"	.01
C22	"	"	.001
A31	± 11.5	3	.01
A32	"	"	.001
B31	± 14.0	"	.01
B32	"	"	.001
C31	± 18.0	"	.01
C32	"	"	.001
A51	± 11.5	5	.01
A52	"	"	.001
A54	"	"	.00001
A56	"	"	.0000001
B51	± 14.0	"	.01
B52	"	"	.001
B54	"	"	.00001
B56	"	"	.0000001
C51	± 18.0	"	.01
C52	"	"	.001
C54	"	"	.00001
C56	"	"	.0000001

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TABLE A-1, Part 2 of 2
FILTER IDENTIFICATION CODE

<u>Filter Code</u>	<u>Passband (deg)</u>	<u>Quantity of Poles</u>	<u>Ripple (dB)</u>
A31"b"	± 11.5	3	.01
B31"b"	± 14.0	"	"
C31"b"	± 18.0	"	"
A31"o"20°	$\theta_m = 20$	"	"
A31"o"30°	$\theta_m = 30$	"	"
B31"o"20°	$\theta_m = 20$	"	"
B31"o"30°	$\theta_m = 30$	"	"
C31"o"20°	$\theta_m = 20$	"	"
C31"o"30°	$\theta_m = 30$	"	"

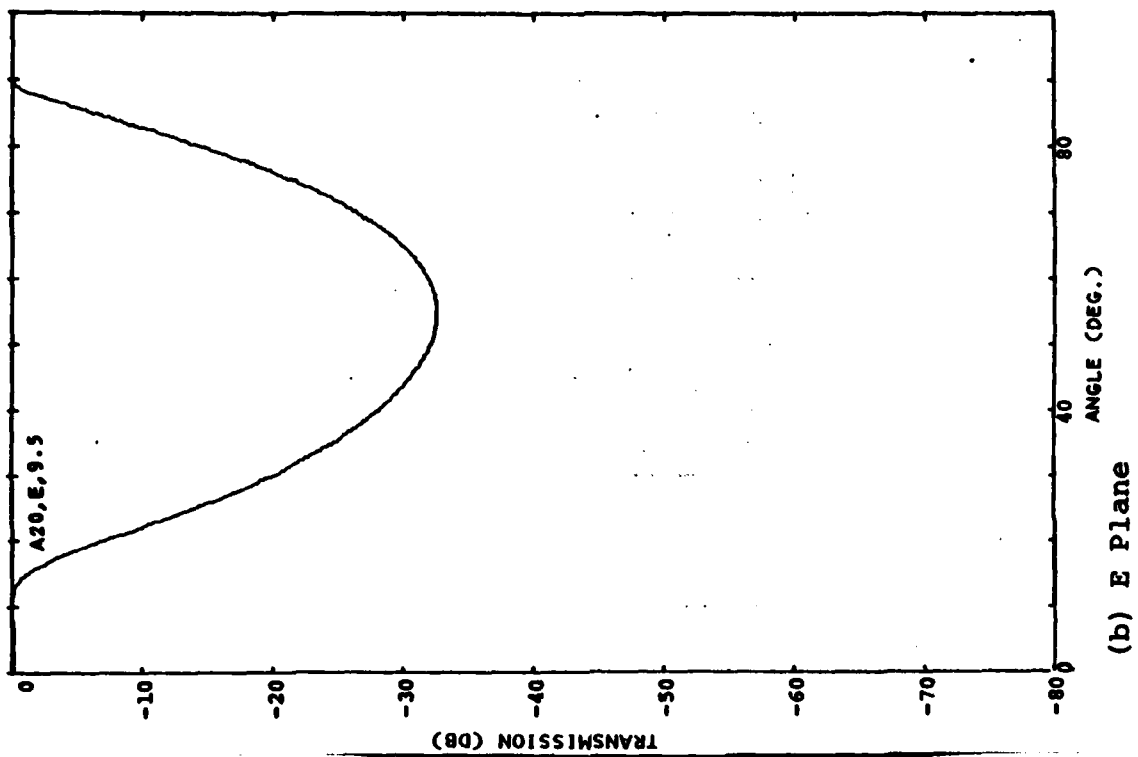
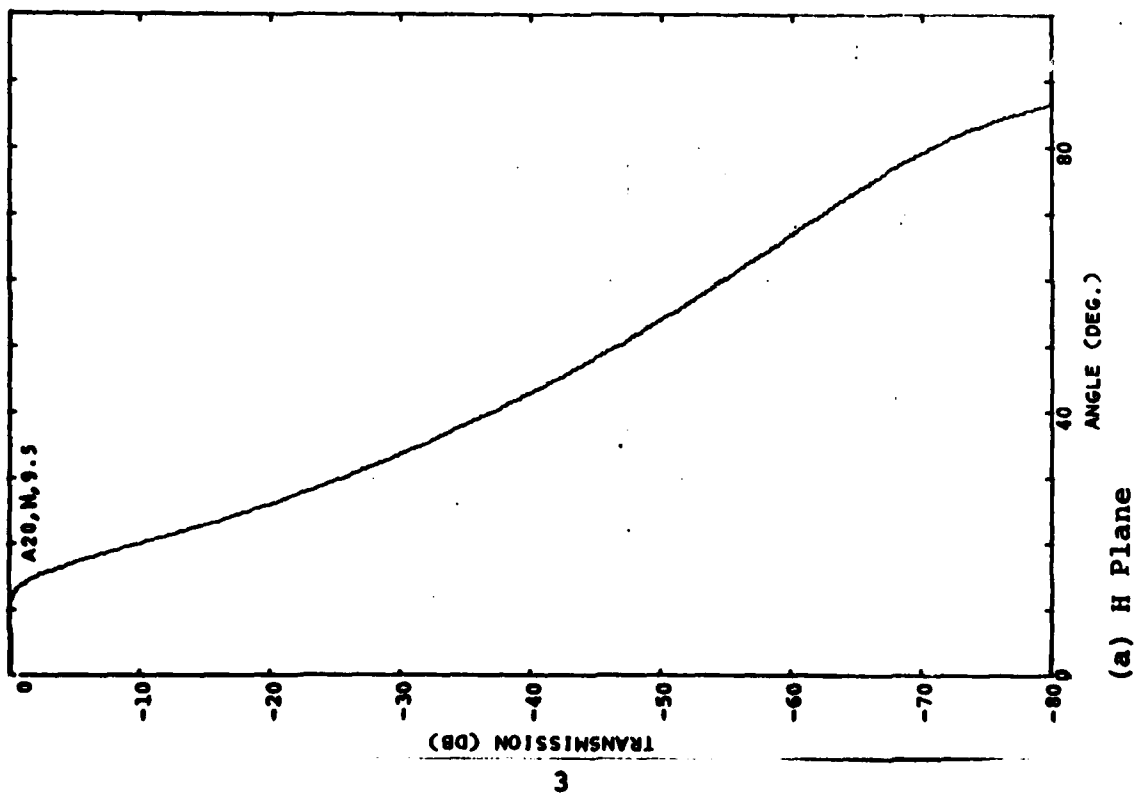


Figure A-1 Transmission, Filter A20, H and E Planes.

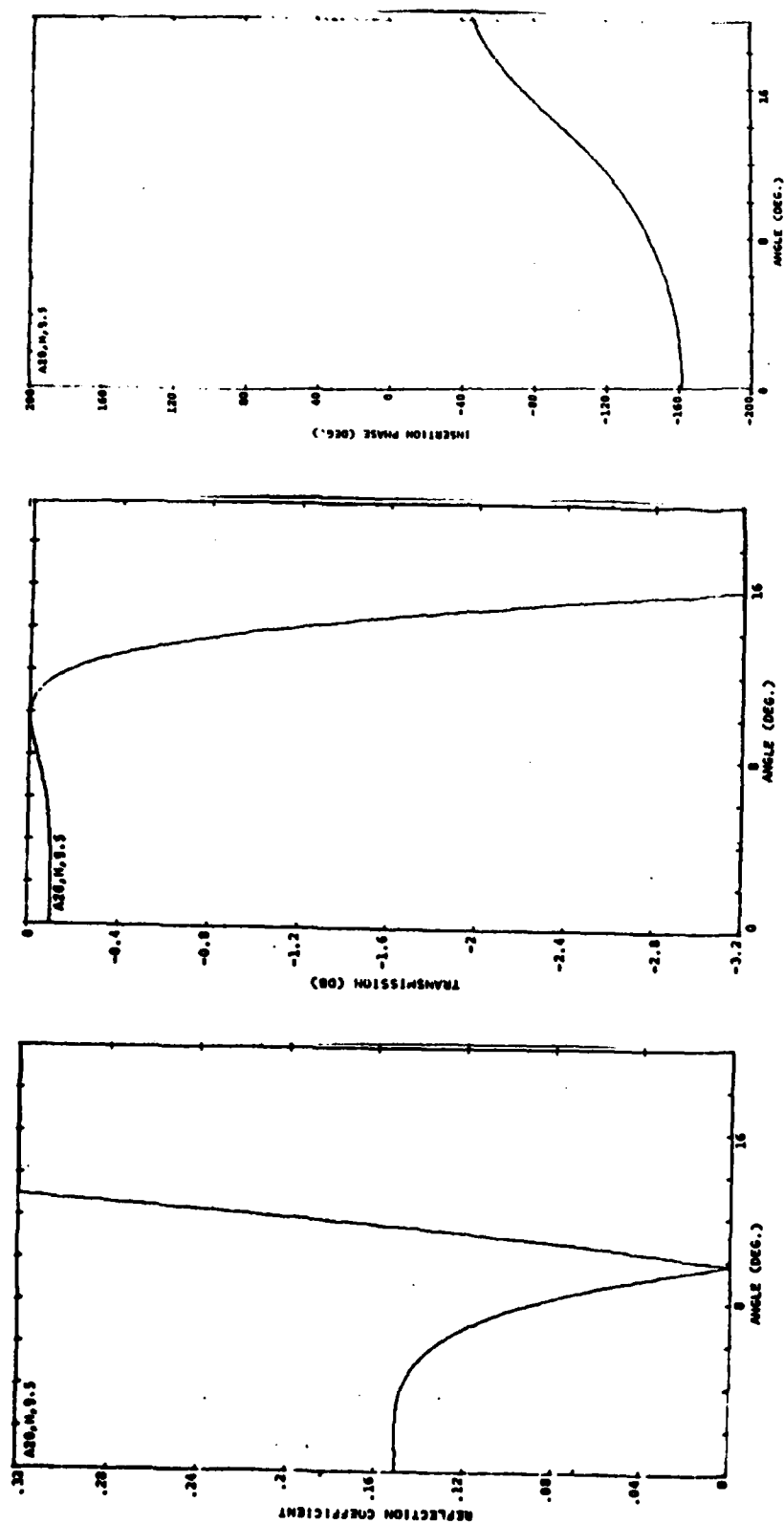


Figure A-2 Passband Reflection and Transmission, Filter A20, H Plane.

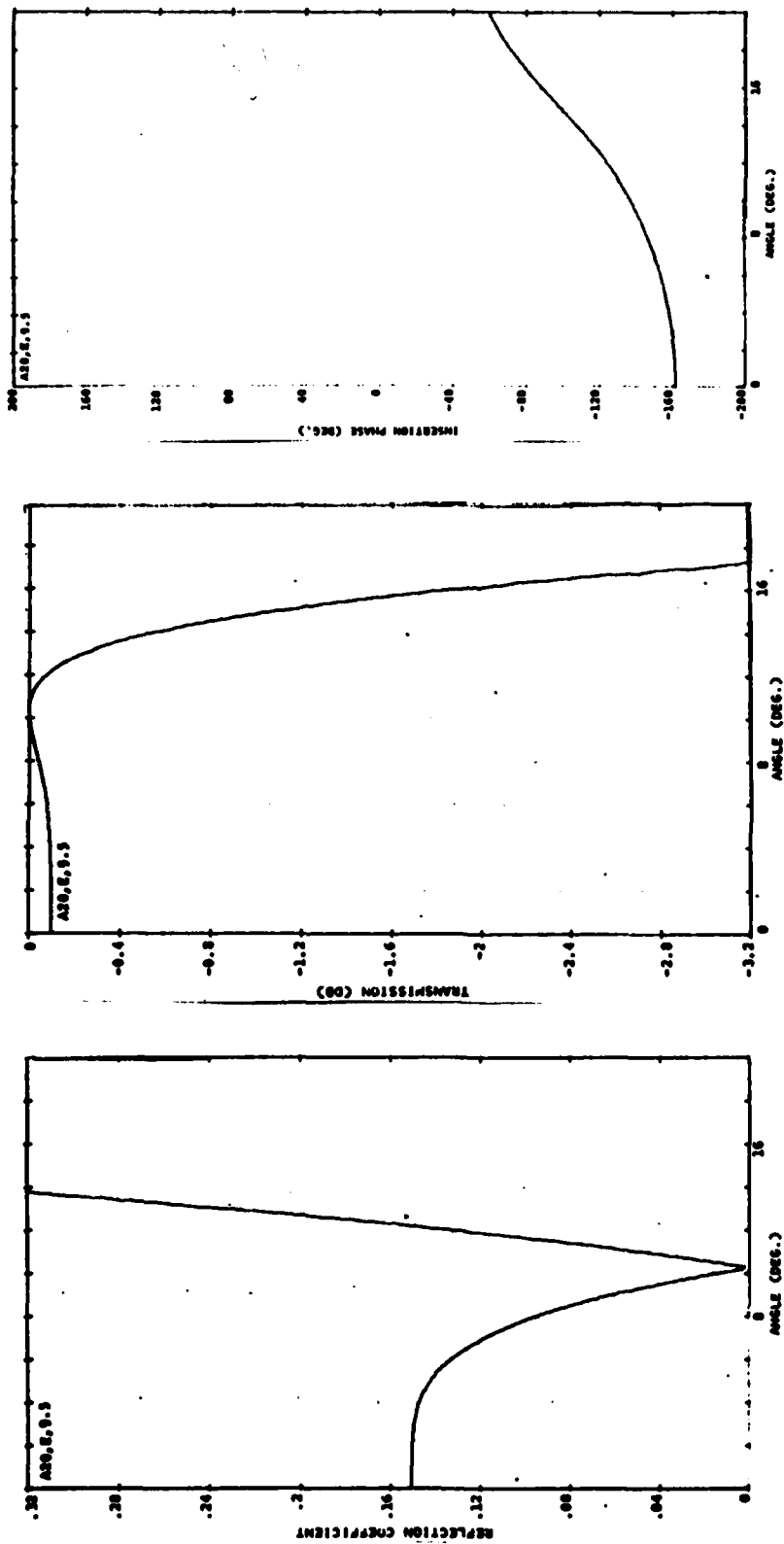
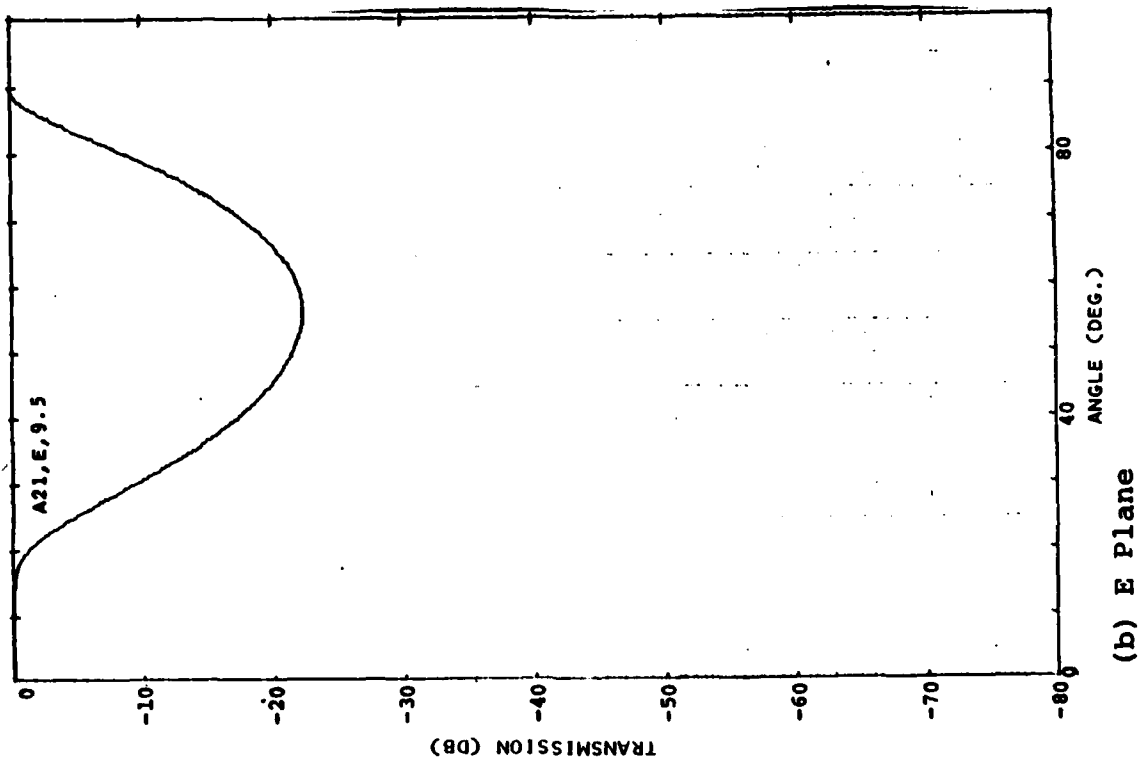
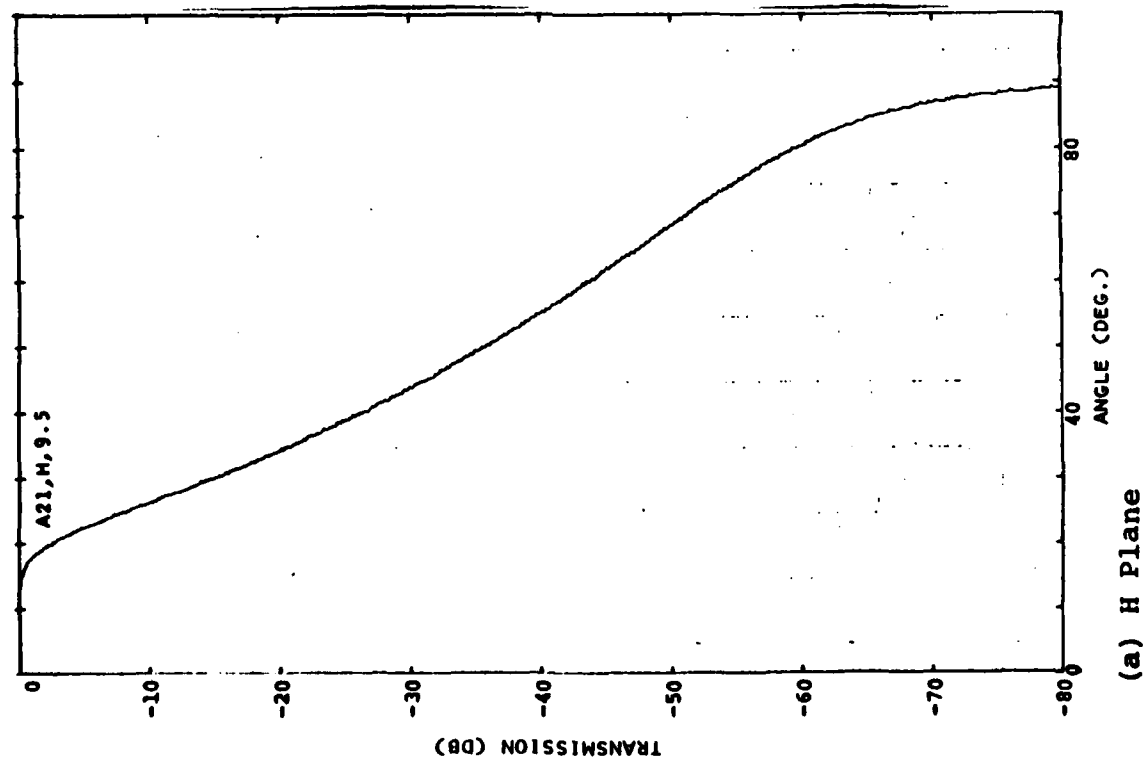


Figure A-3 Passband Reflection and Transmission, Filter A20, E Plane.



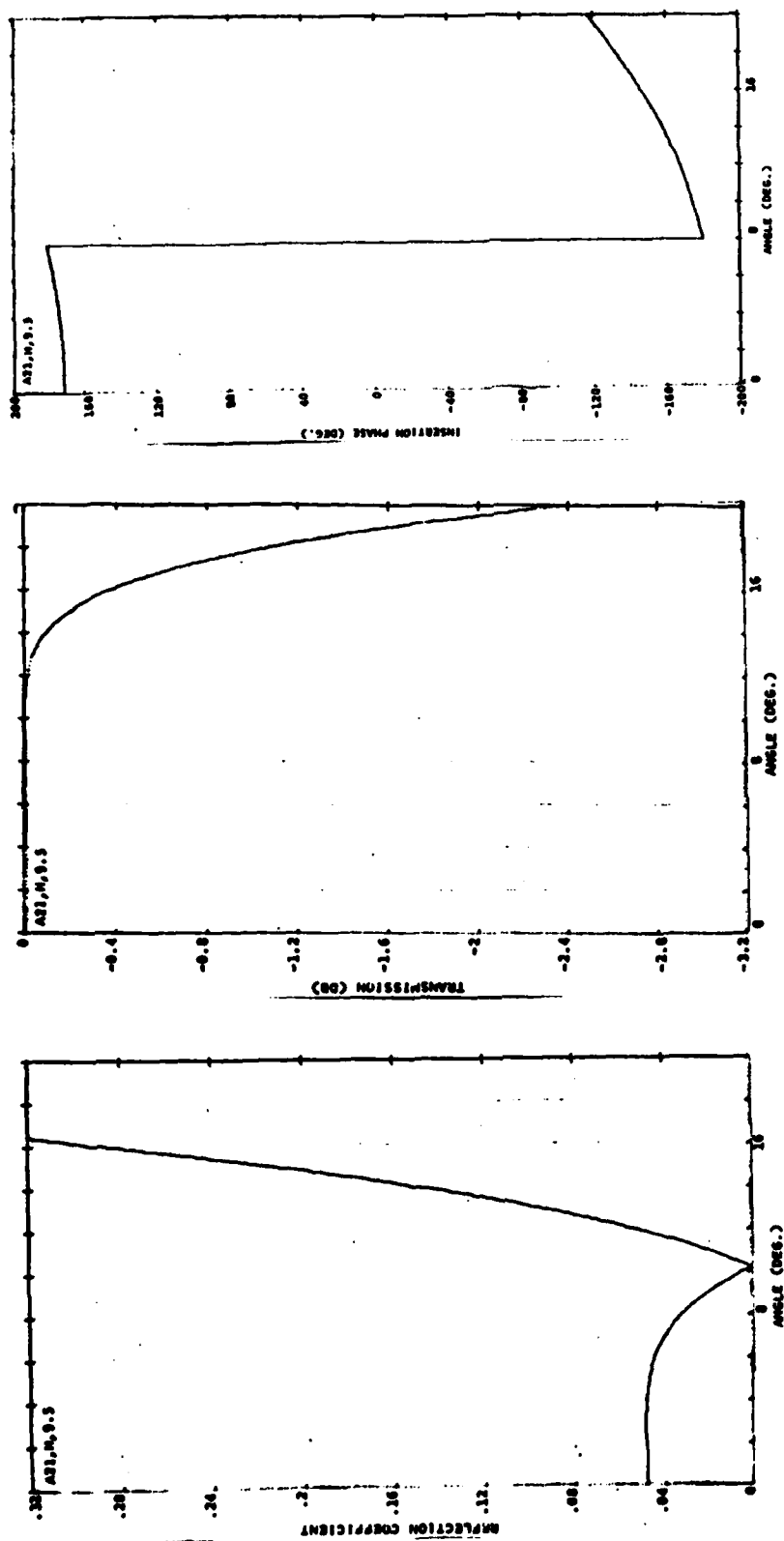


Figure A-5 Passband Reflection and Transmission, Filter A21, H Plane.

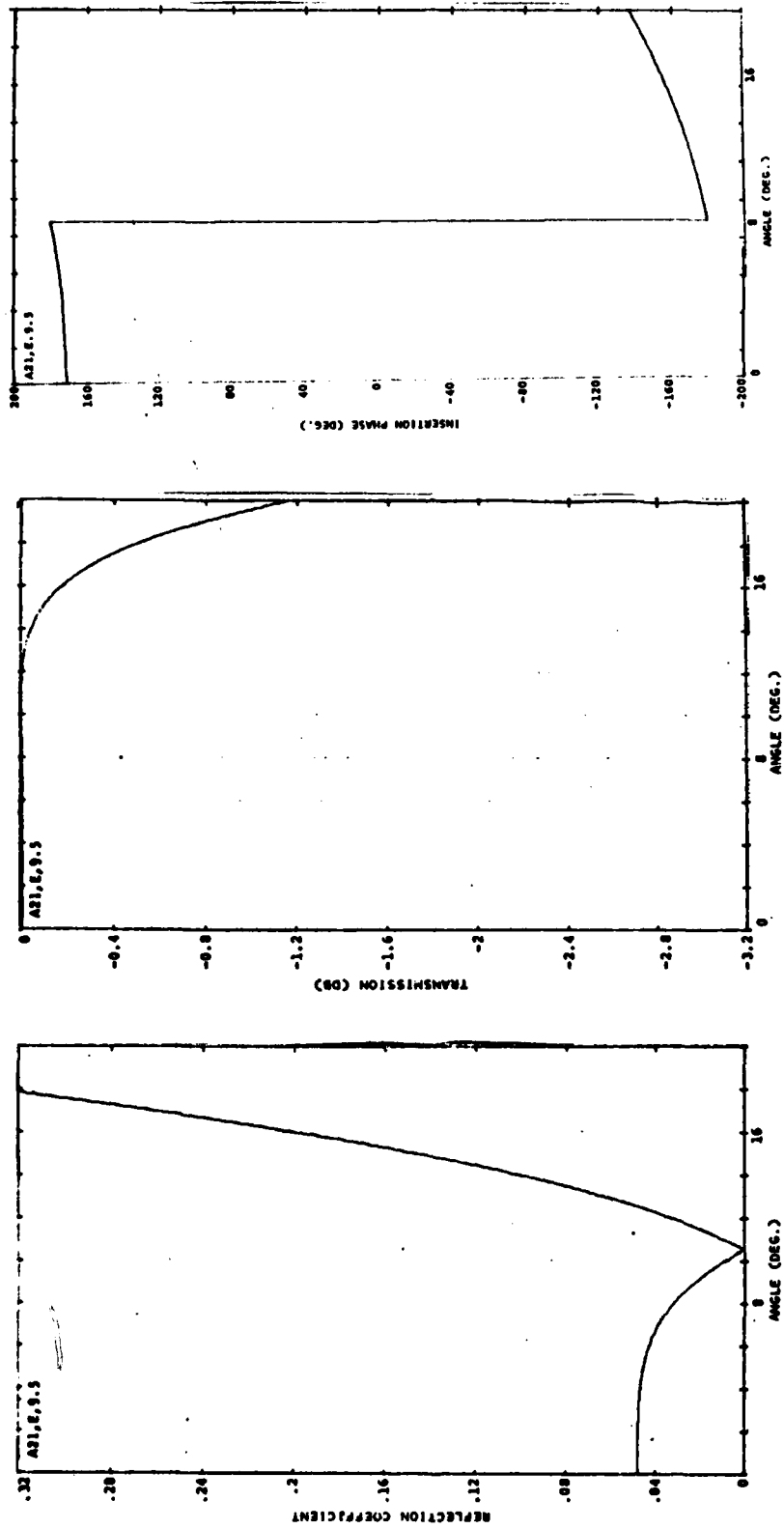
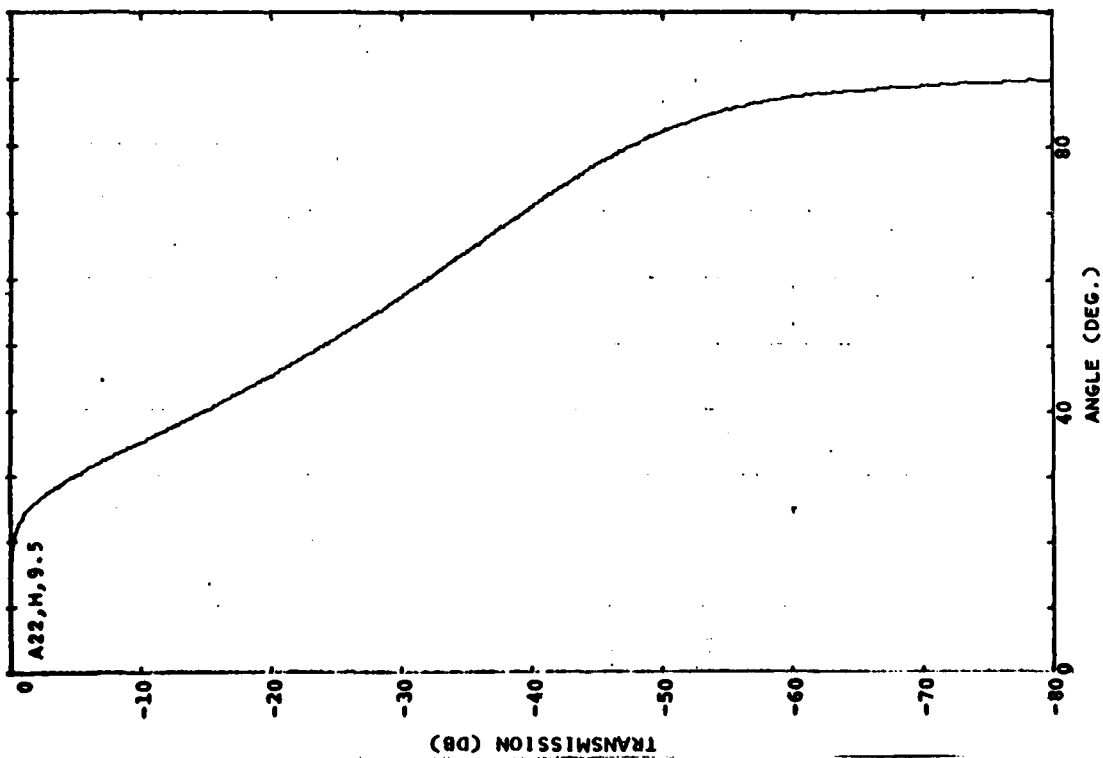
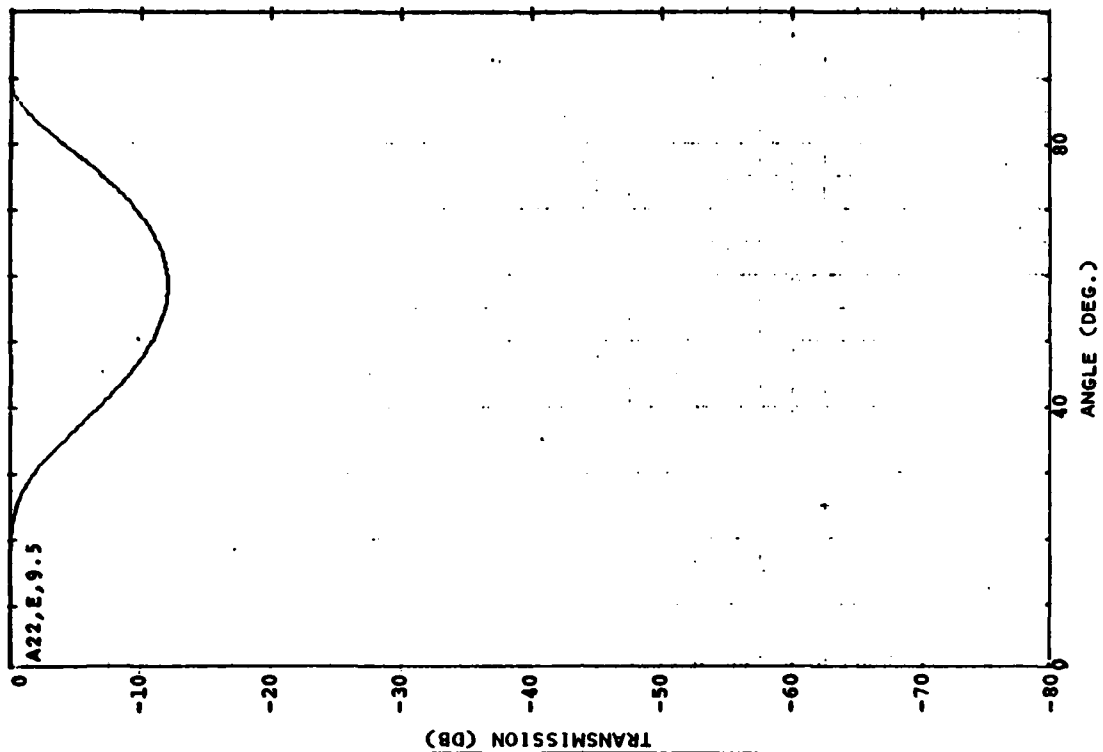


Figure A-6 Passband Reflection and Transmission, Filter A21, E Plane.



(a) H Plane



(b) E Plane

Figure A-7 Transmission, Filter A22, H and E Planes.

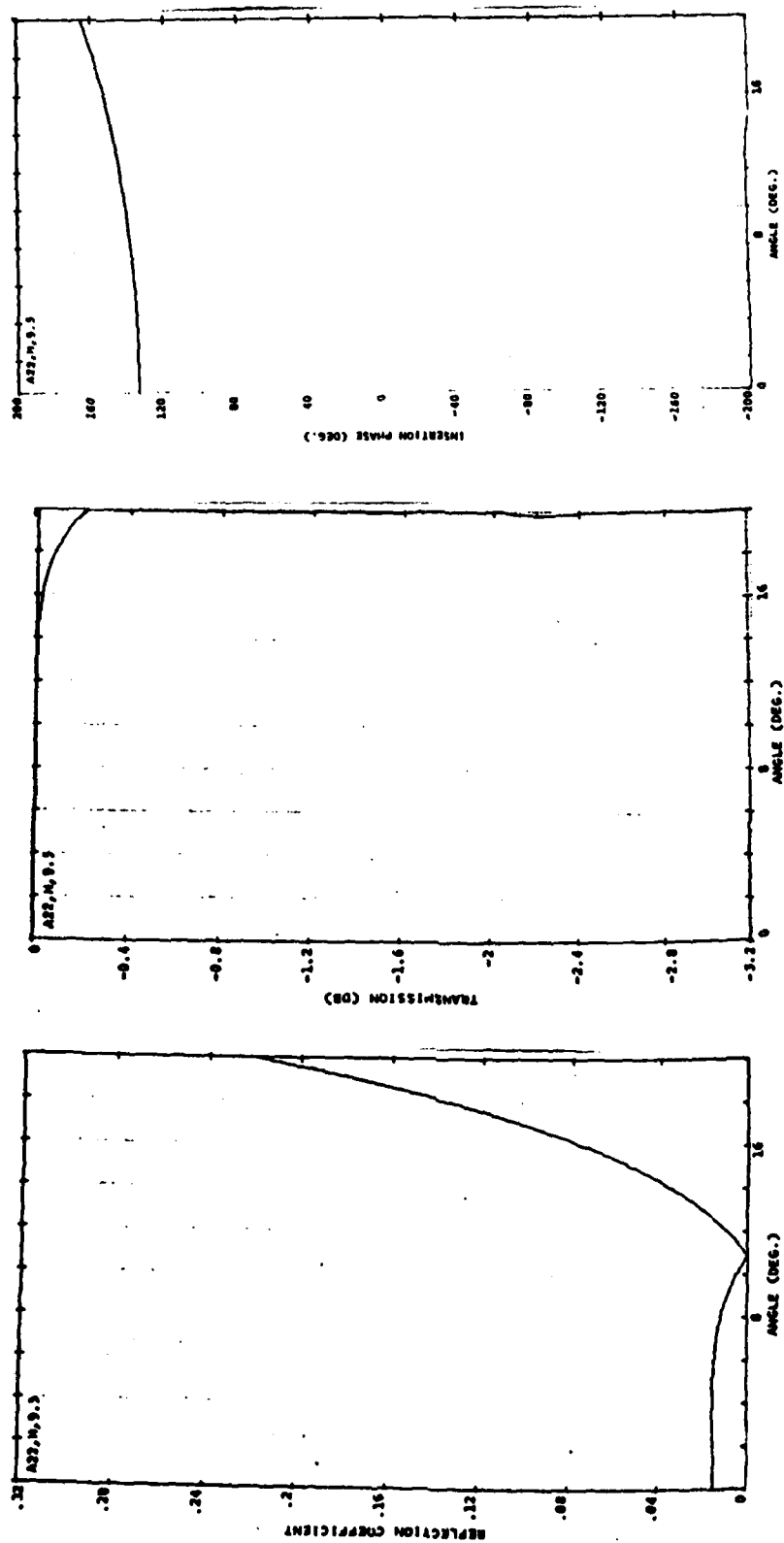


Figure A-8 Passband Reflection and Transmission, Filter A22, H Plane.

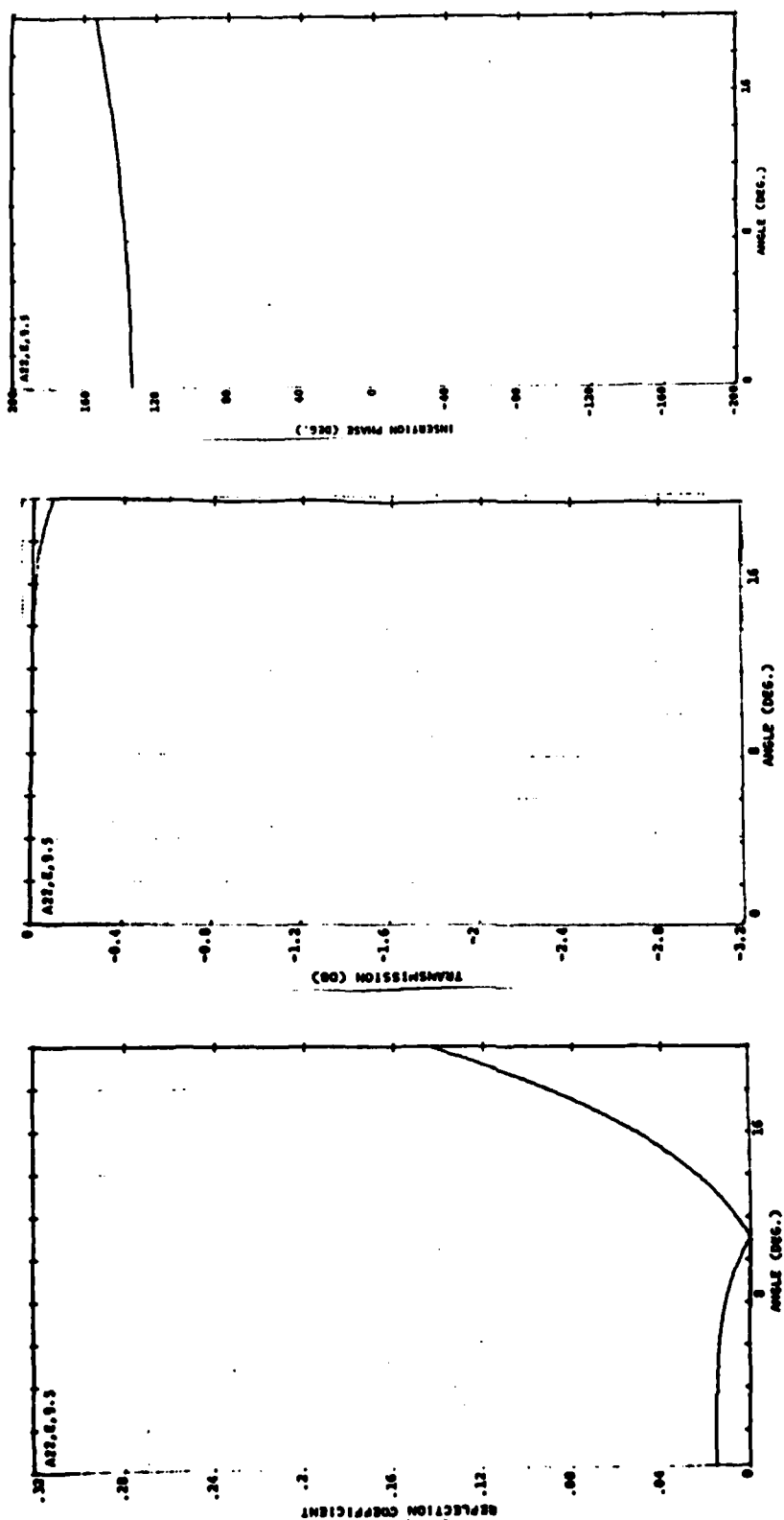
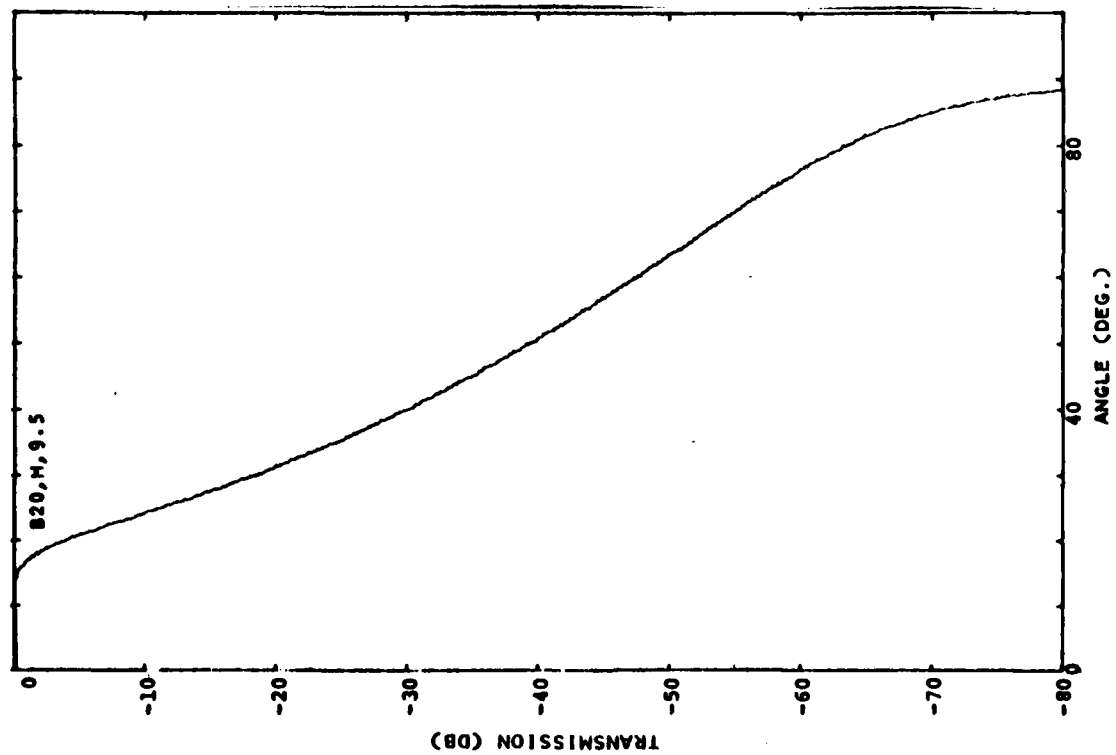
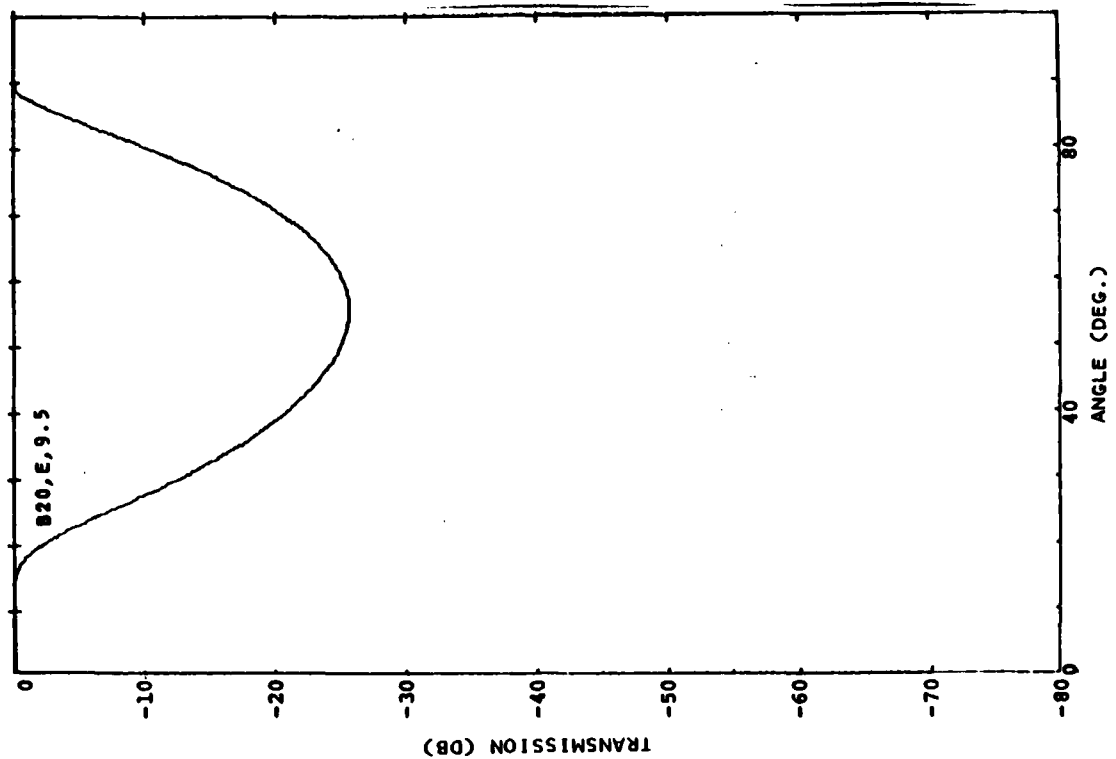


Figure A-9 Passband Reflection and Transmission, Filter A22, E Plane.



(a) H Plane



(b) E Plane

Figure A-10 Transmission, Filter B20, H and E Planes.

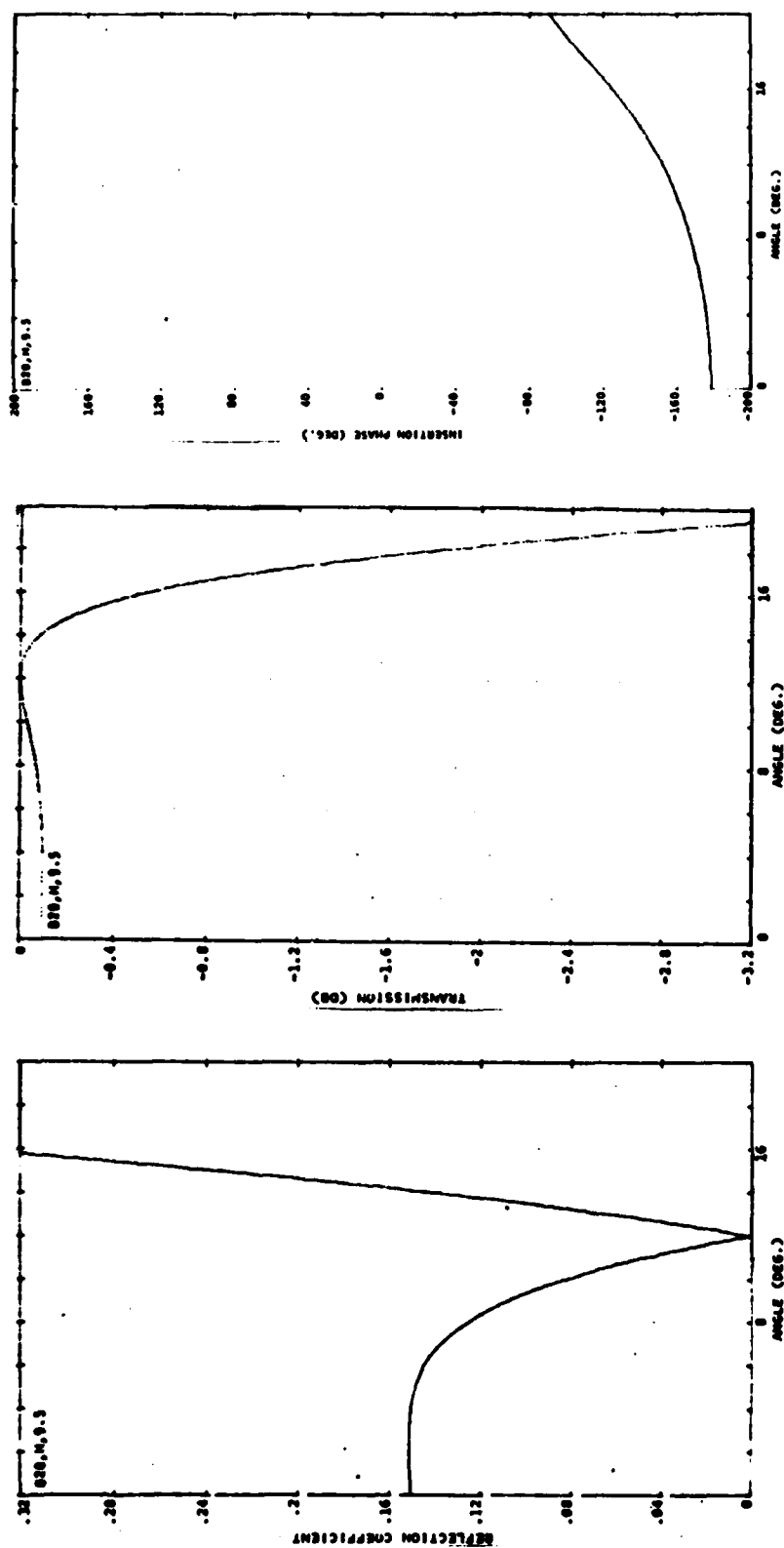


Figure A-11 Passband Reflection and Transmission, Filter B20, H Plane.

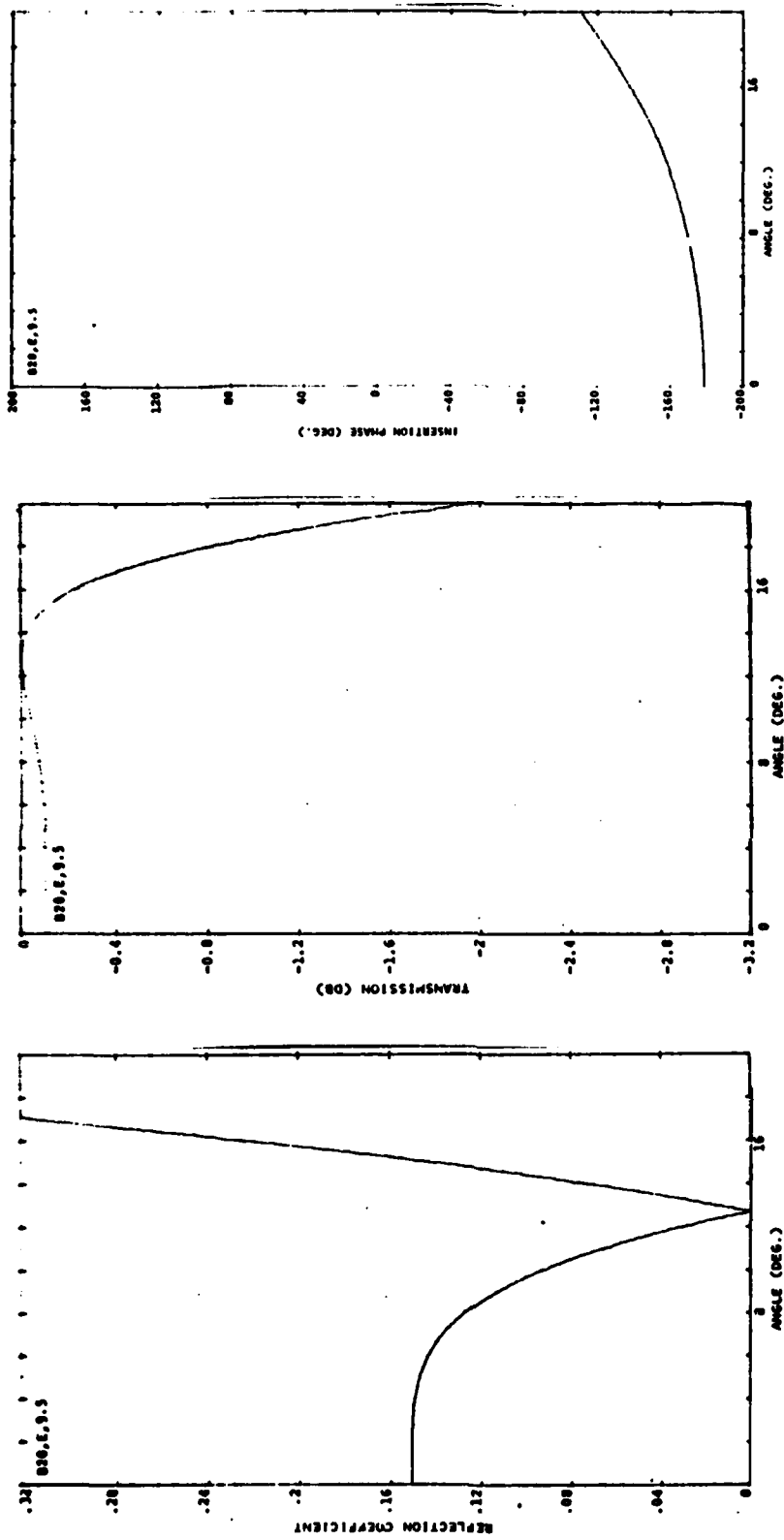
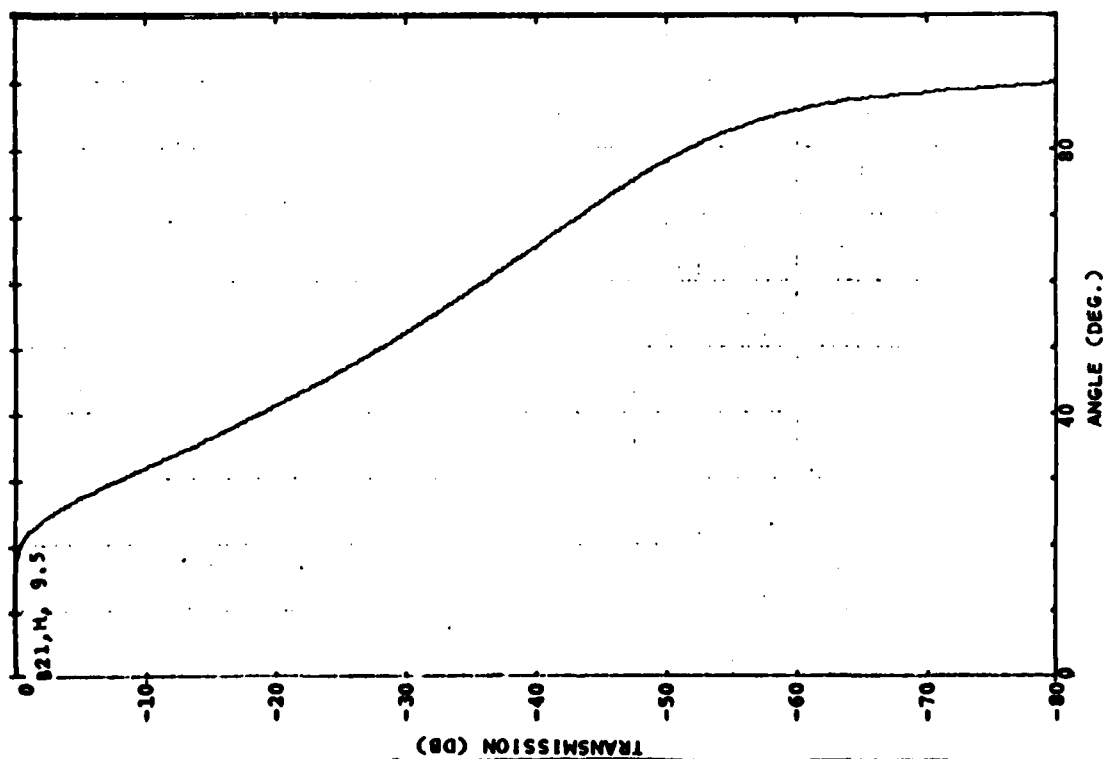
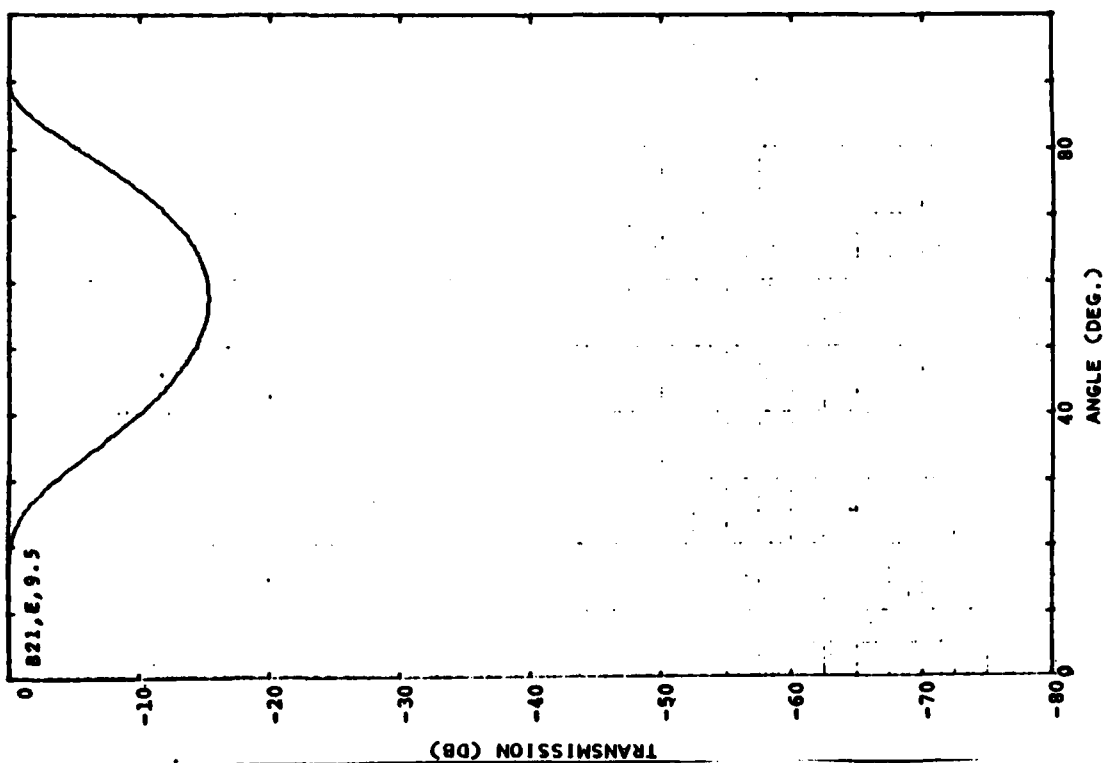


Figure A-12 Passband Reflection and Transmission, Filter B20, E Plane.



(a) H Plane



(b) E Plane

Figure A-13 Transmission, Filter B21, H and E Planes.

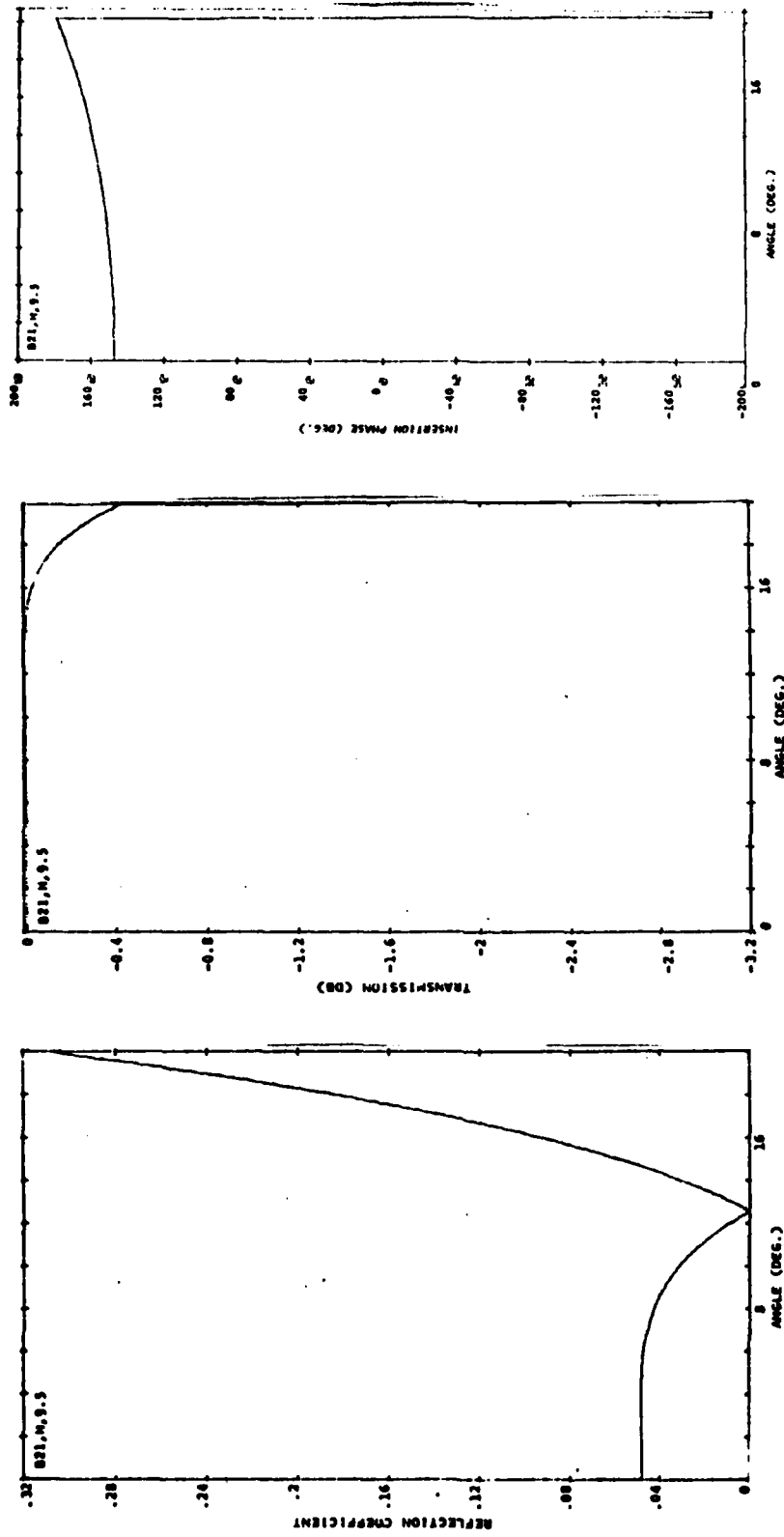


Figure A-14 Passband Reflection and Transmission, Filter B21, H Plane.

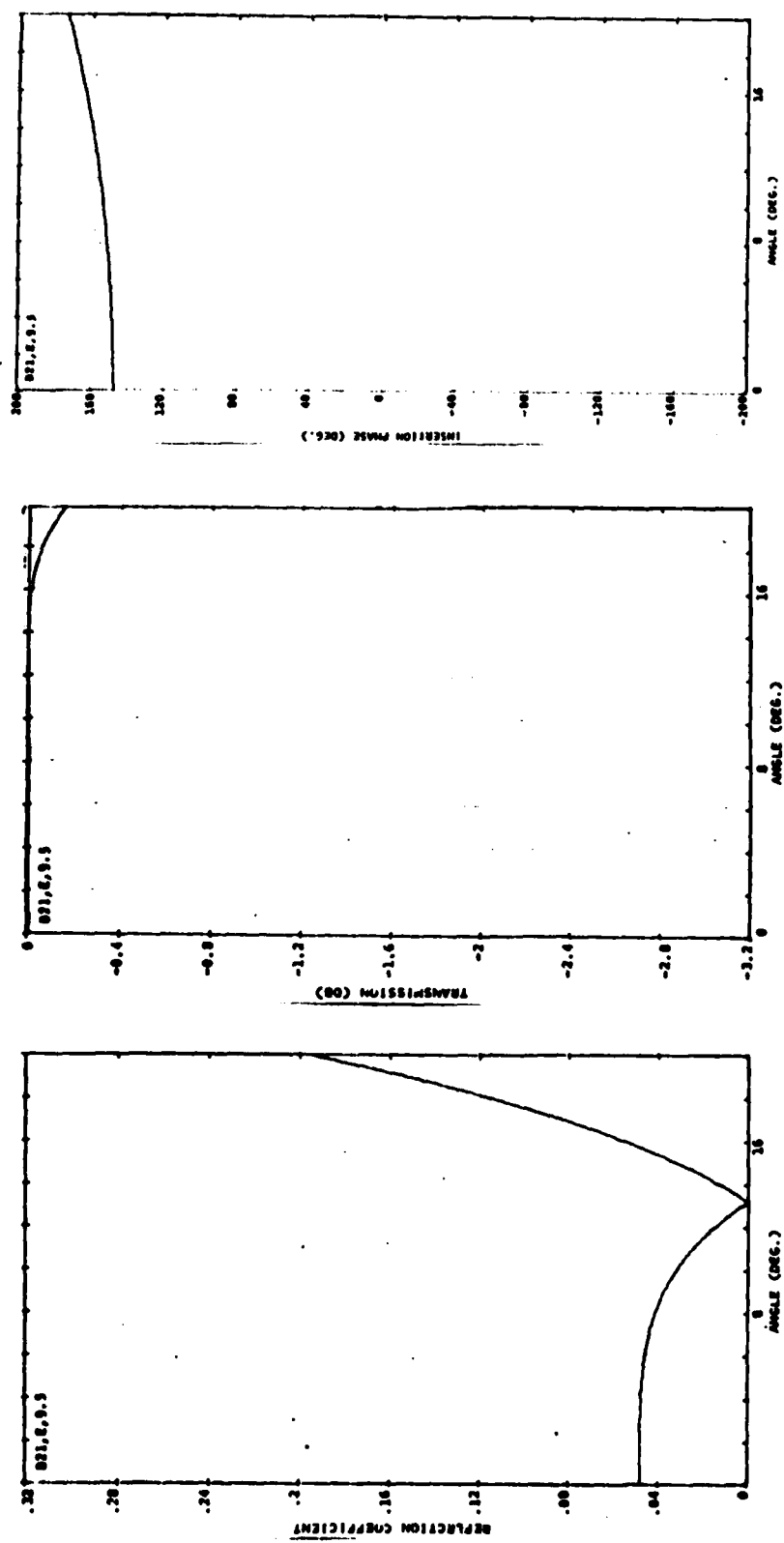
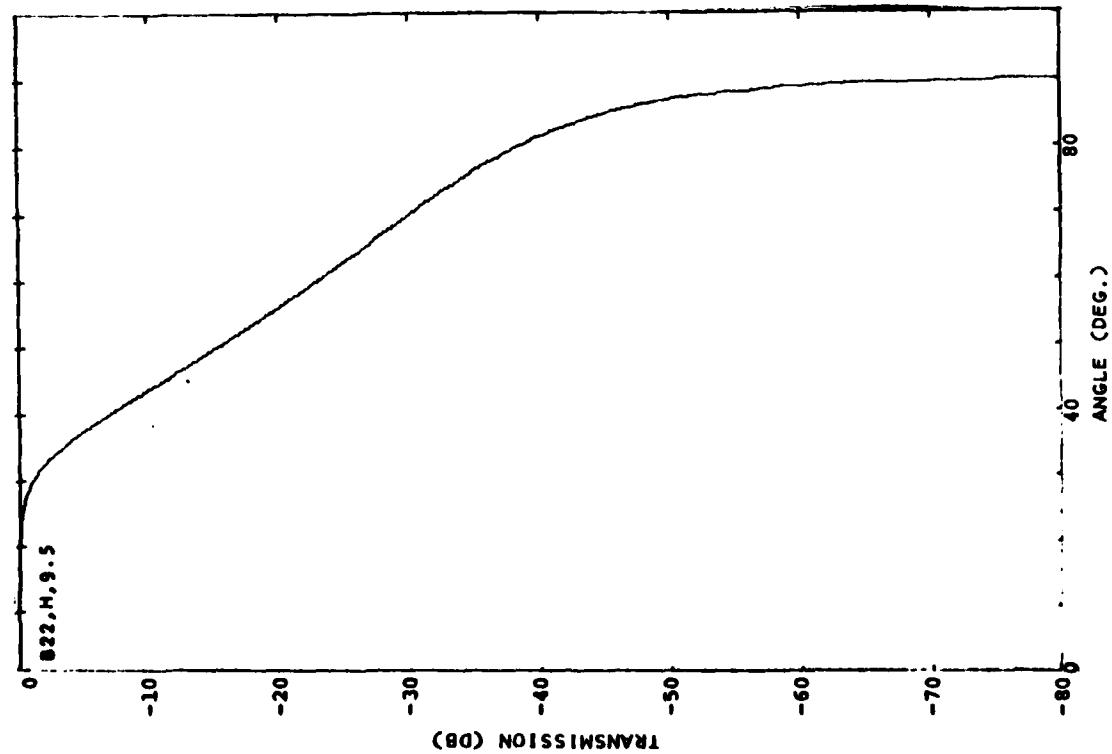
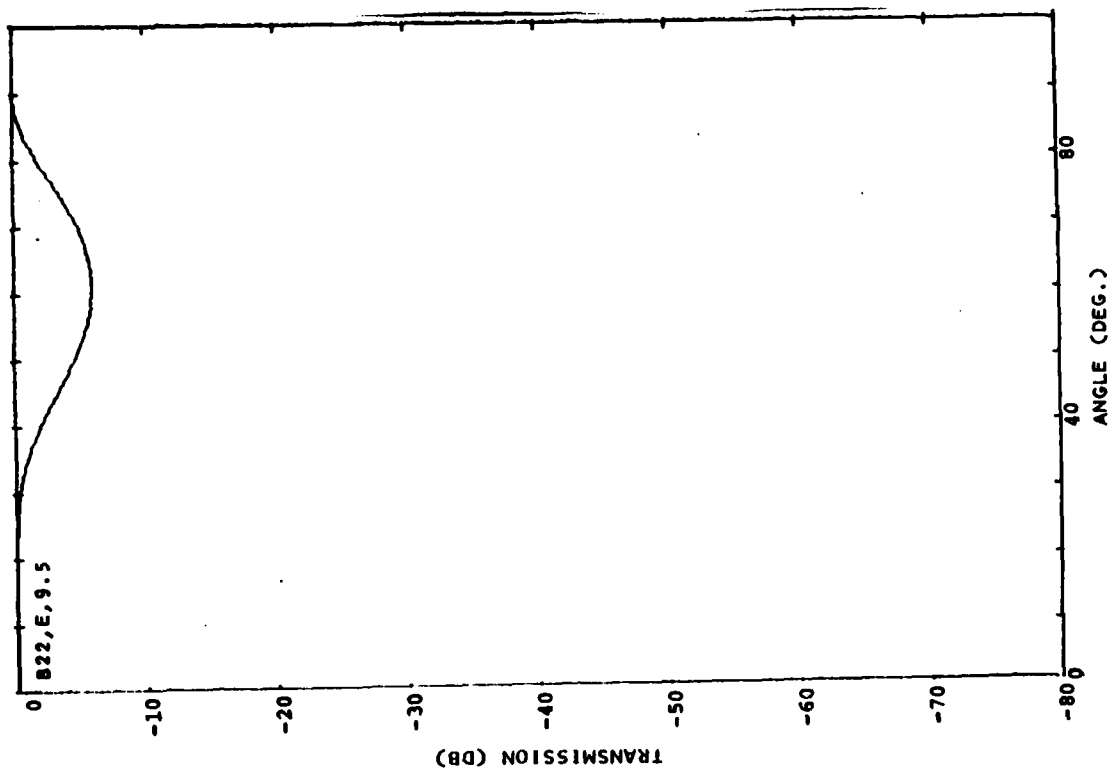


Figure A-15 Passband Reflection and Transmission, Filter B21, E Plane.



(a) H Plane



(b) E Plane

Figure A-16 Transmission, Filter B22, H and E Planes.

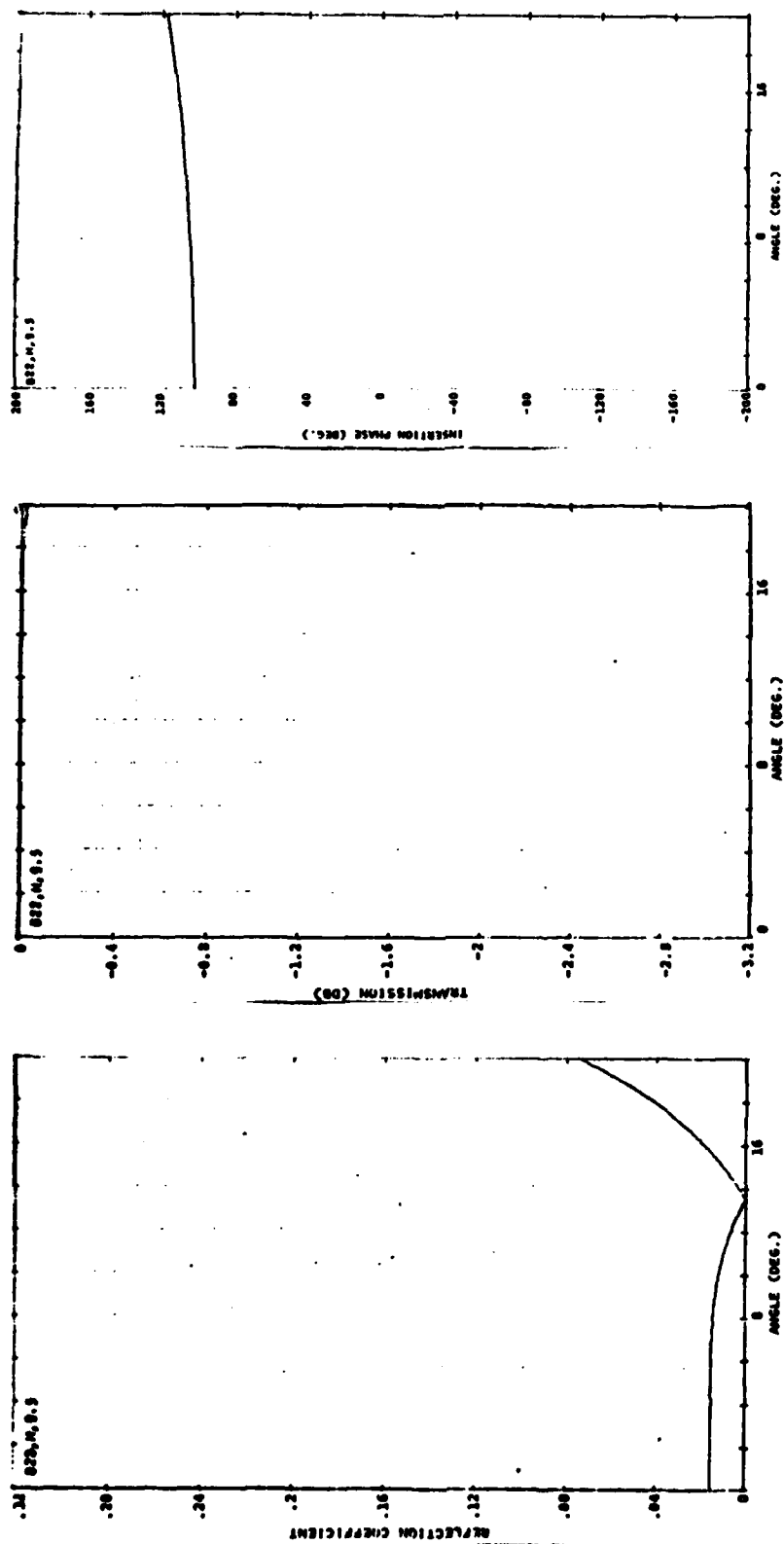


Figure A-17 Passband Reflection and Transmission, Filter B22, H Plane.

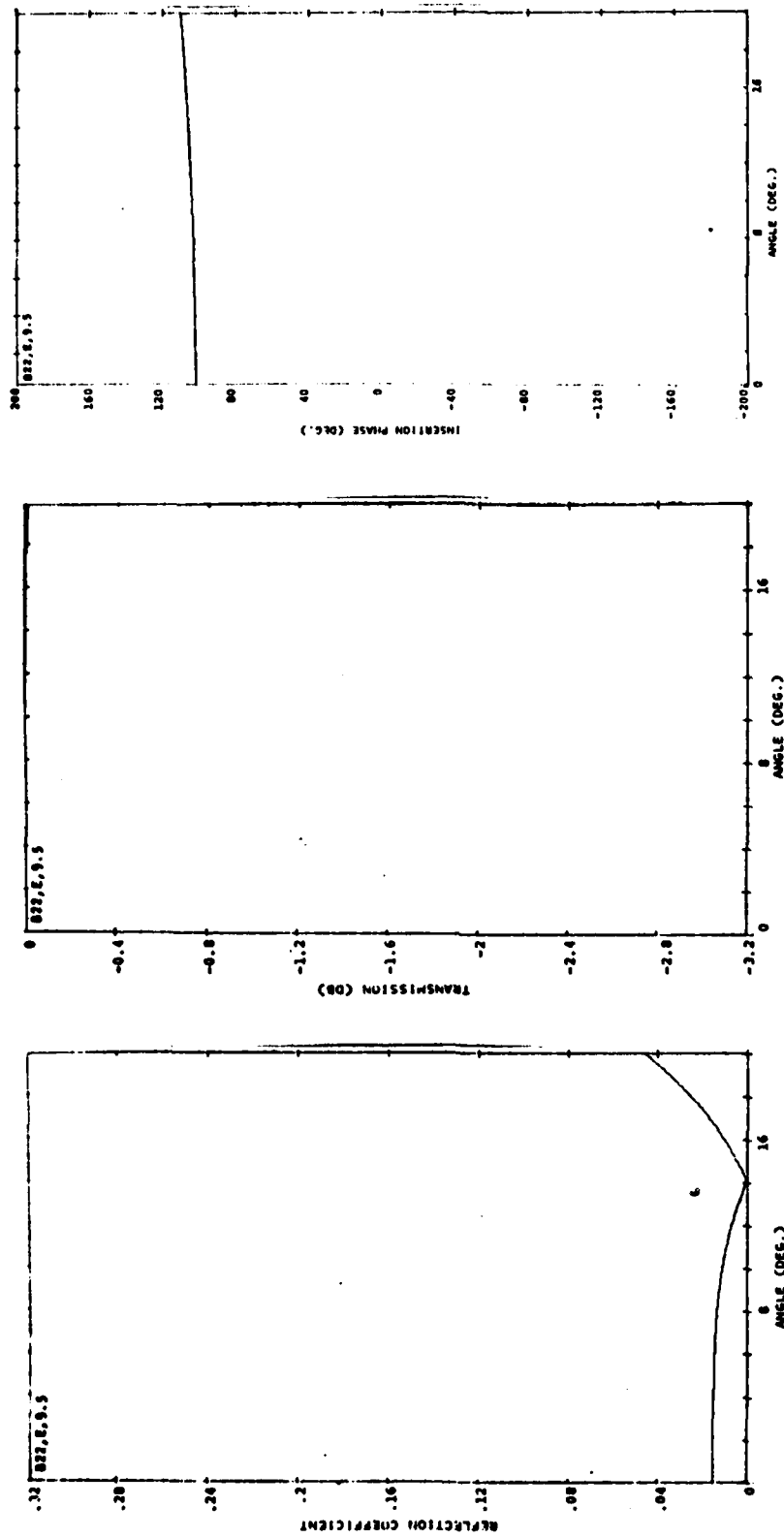
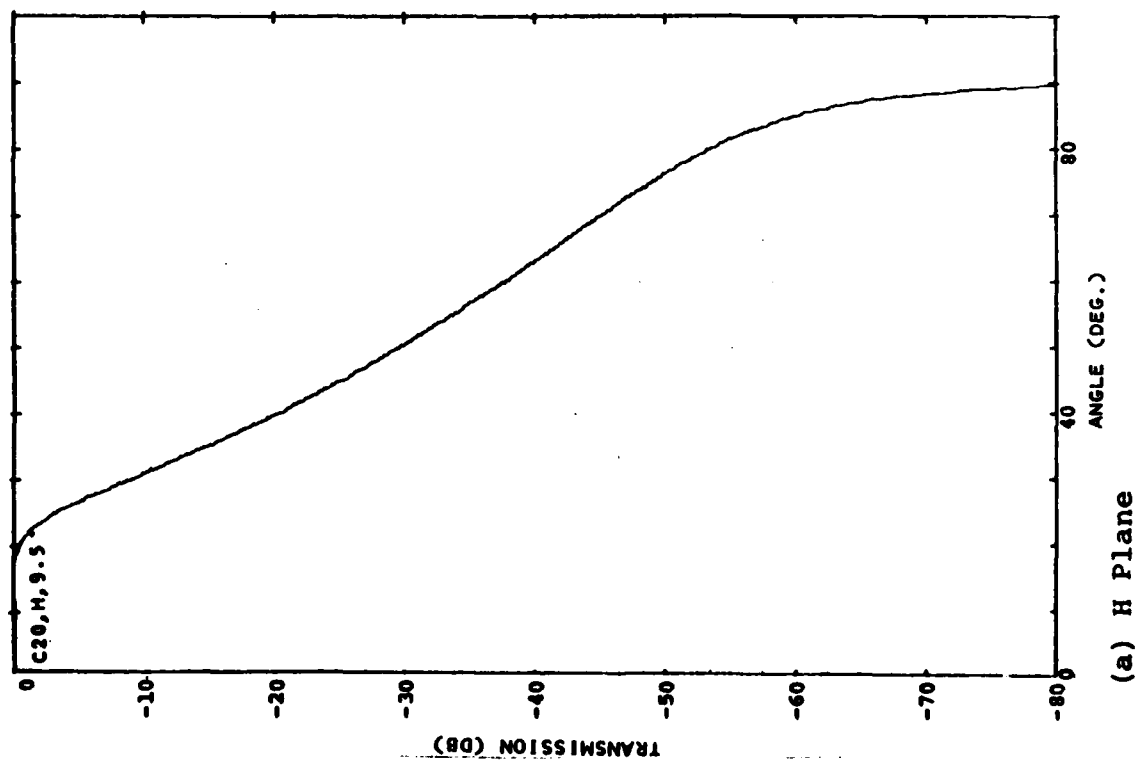
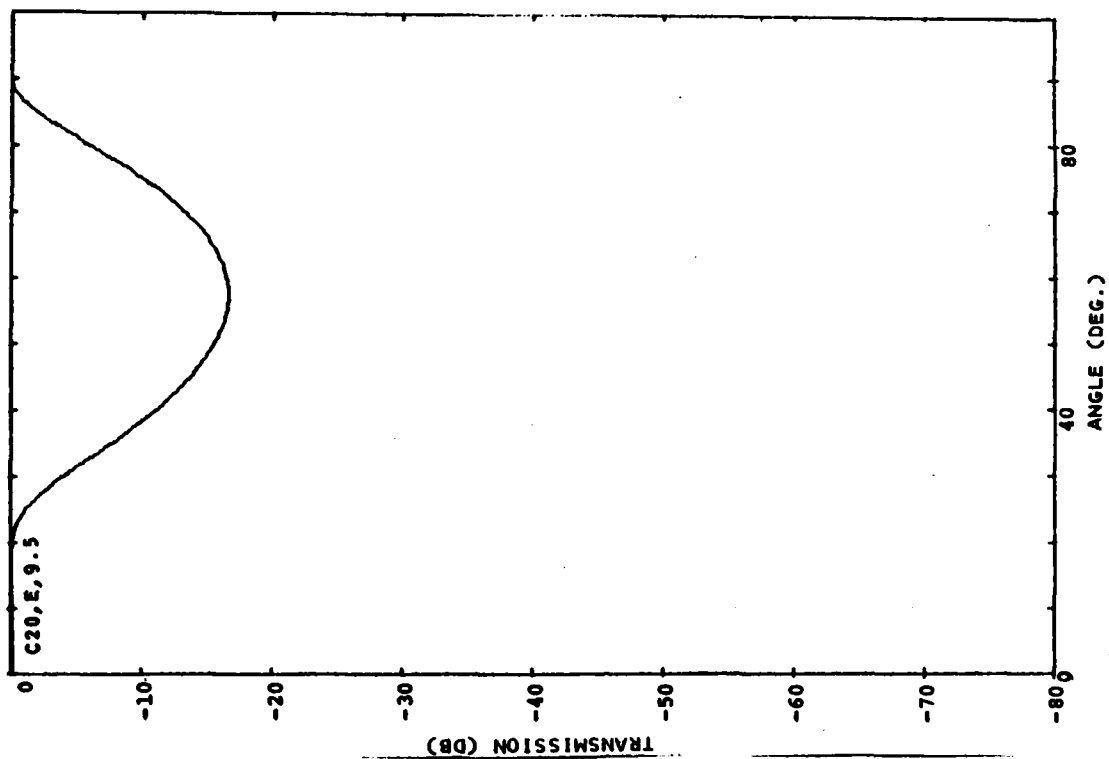


Figure A-18 Passband Reflection and Transmission, Filter B22, E Plane.



(a) H Plane



(b) E Plane

Figure A-19 Transmission, Filter C20, H and E Planes.

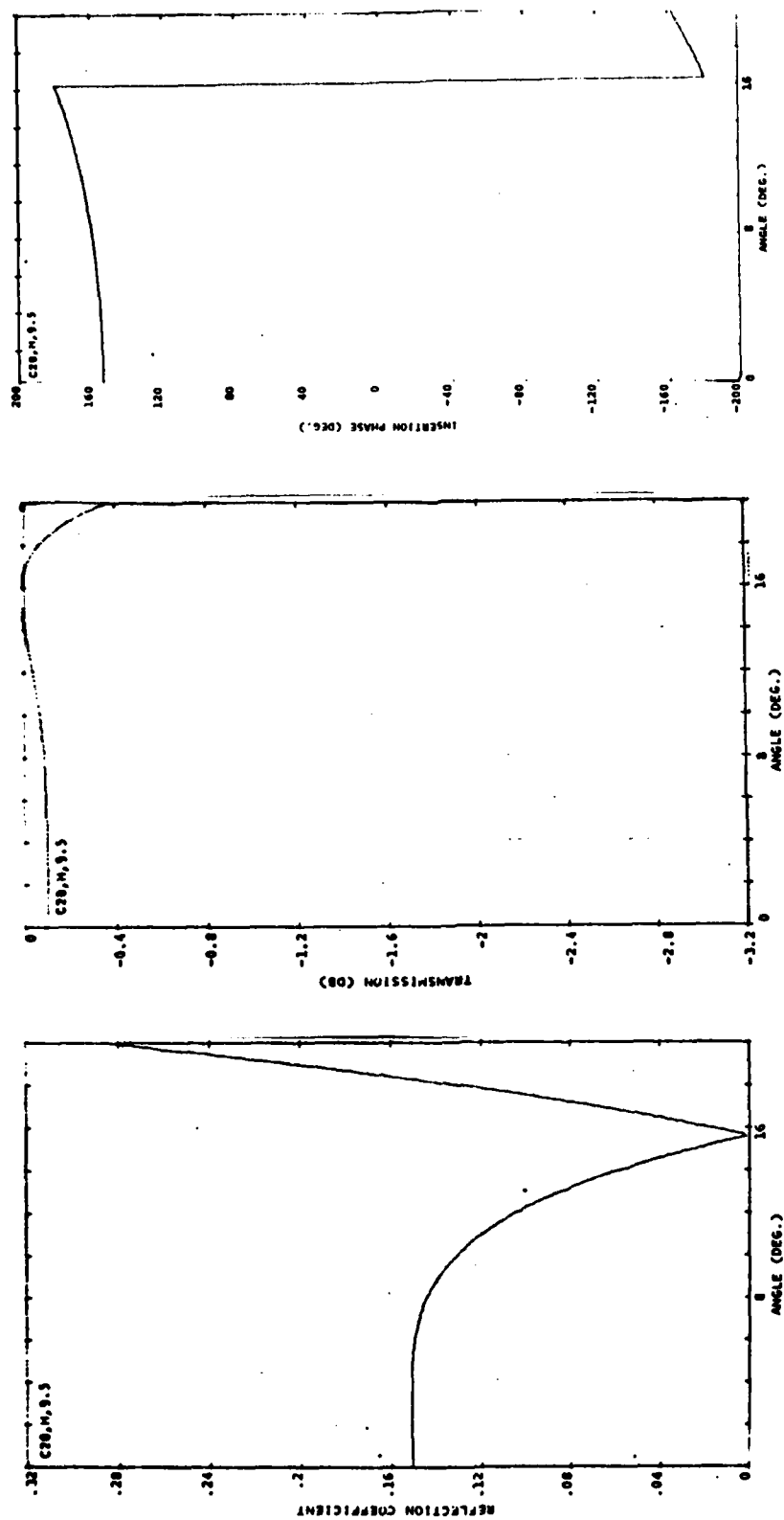


Figure A-20 Passband Reflection and Transmission, Filter C20, H Plane.

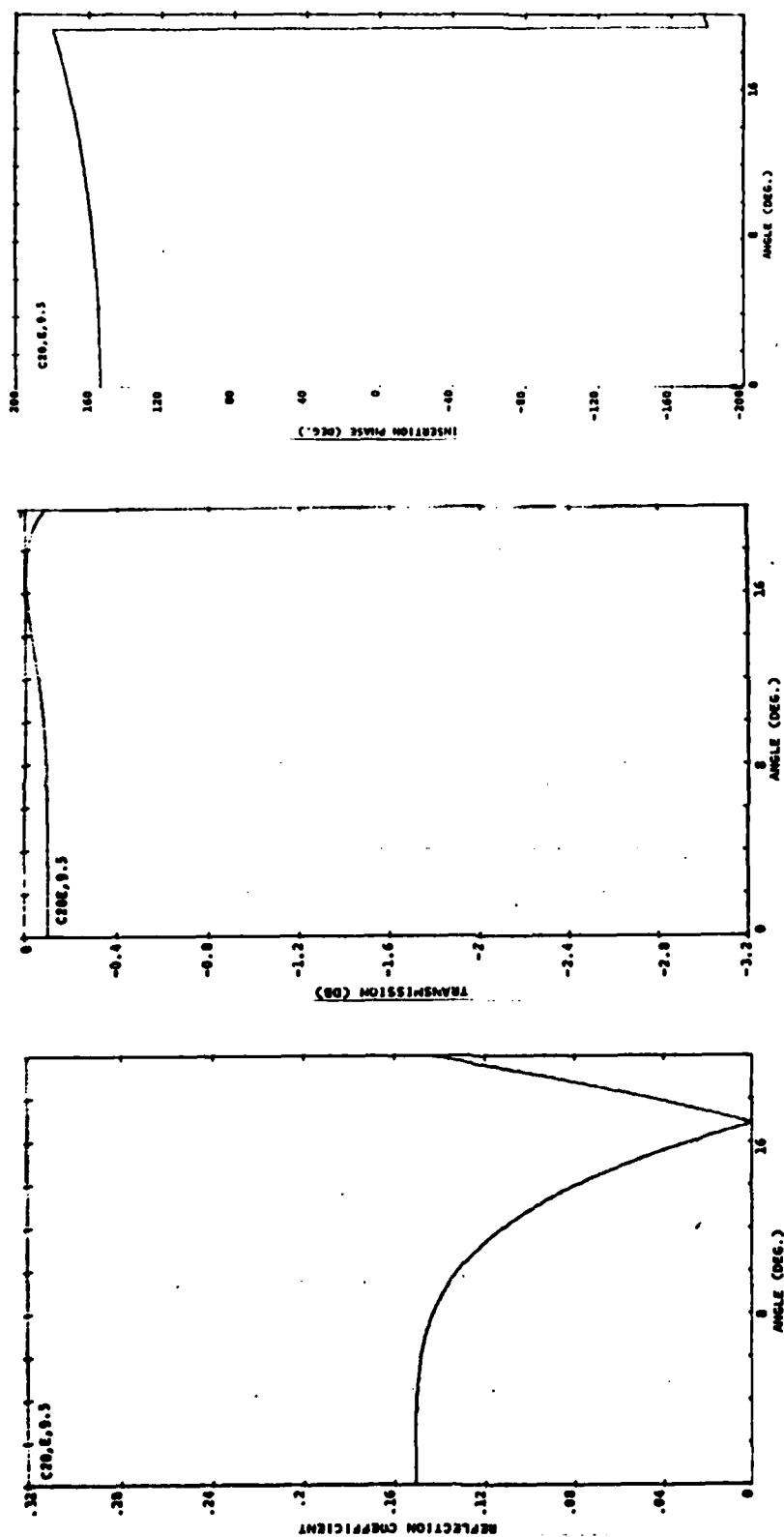
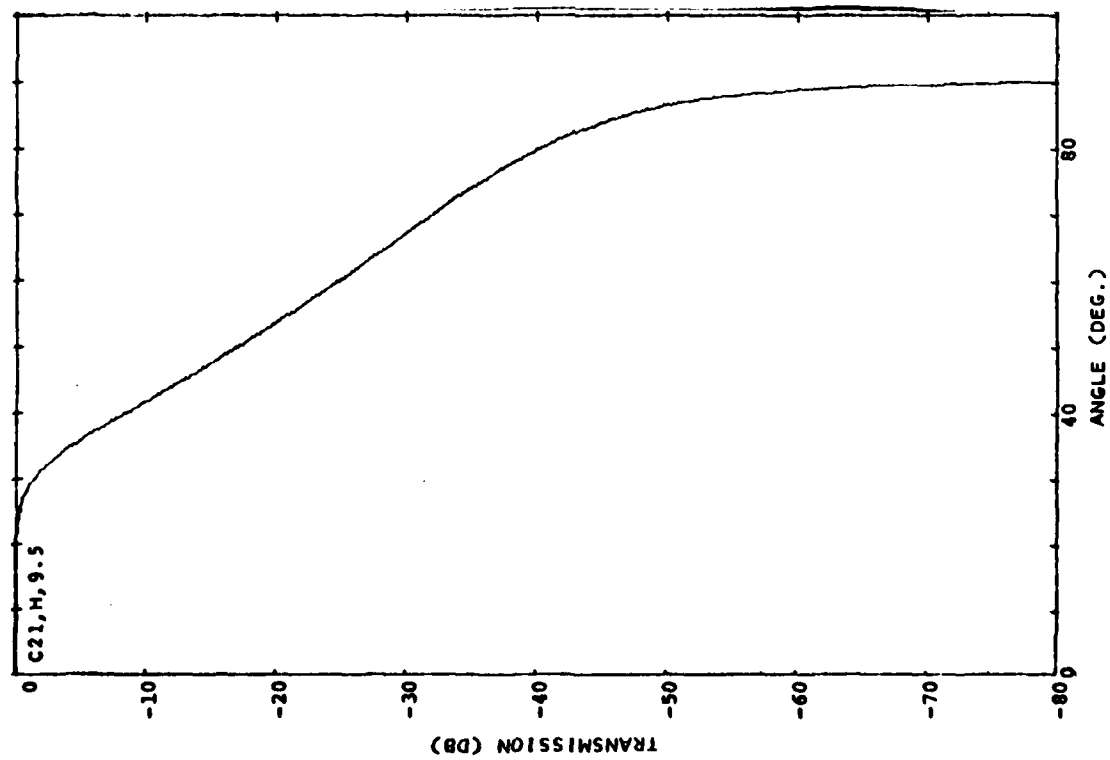
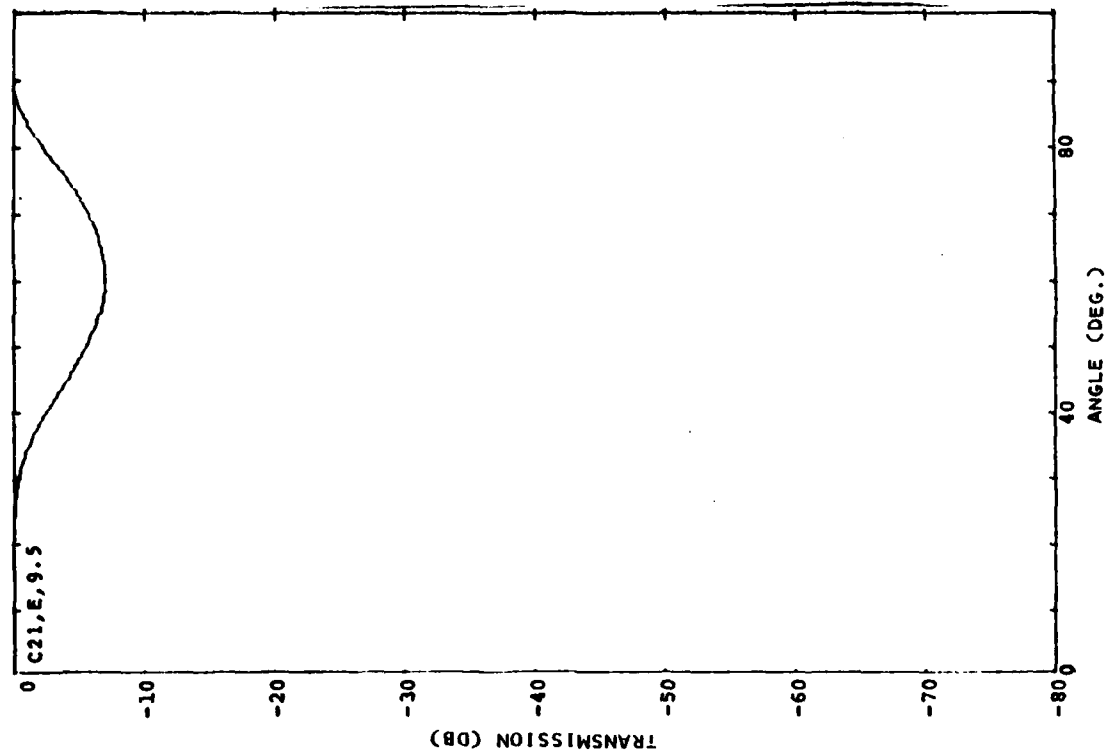


Figure A-21 Passband Reflection and Transmission, Filter C20, E Plane.



(a) H Plane



(b) E Plane

Figure A-22 Transmission, Filter C21, H and E Planes.

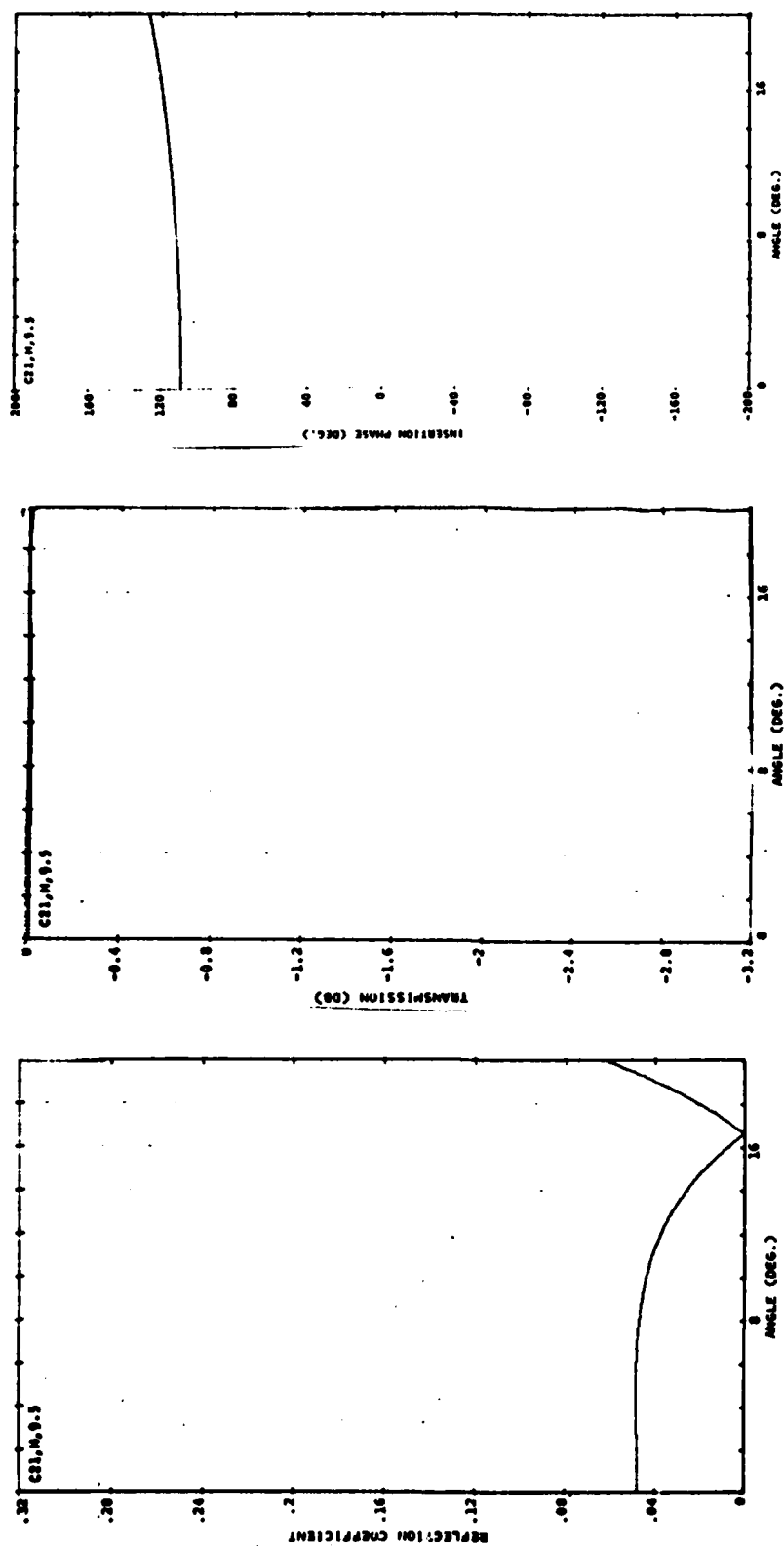


Figure A-23 Passband Reflection and Transmission, Filter C21, H Plane.

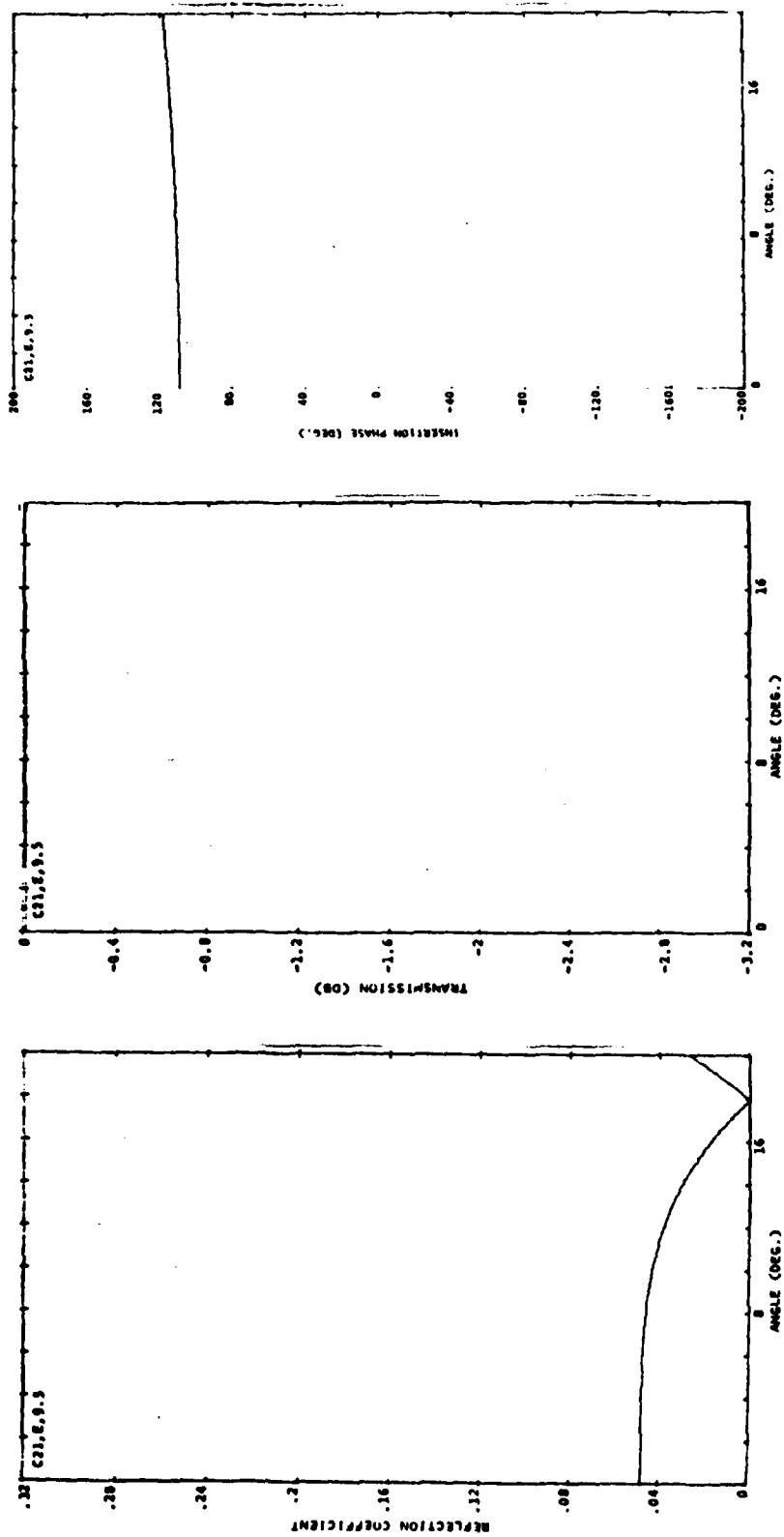


Figure A-24 Passband Reflection and Transmission, Filter C21, E Plane.

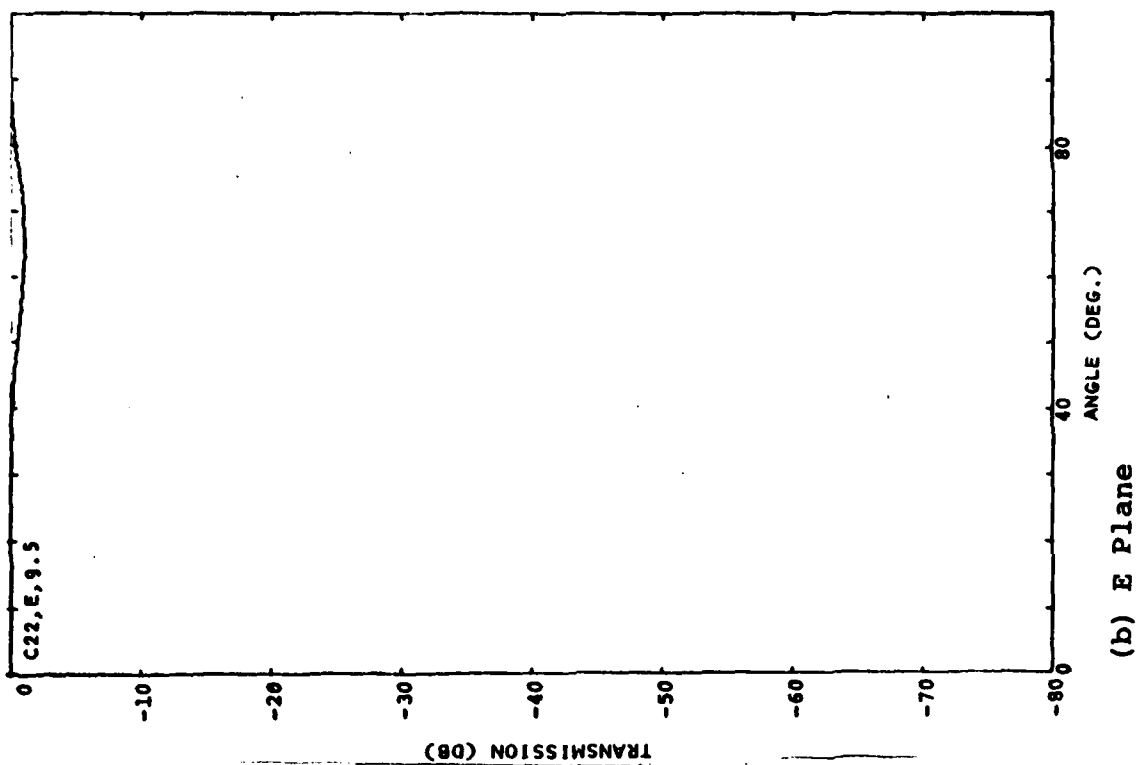
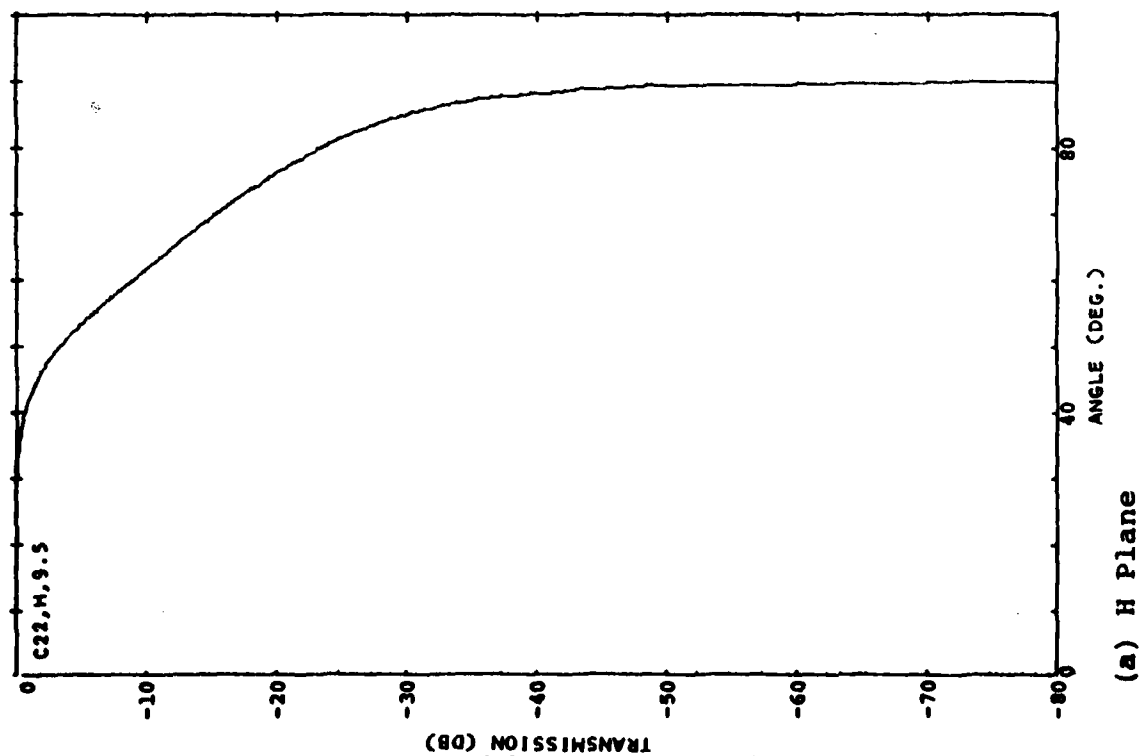


Figure A-25 Transmission, Filter C22, H and E Planes.

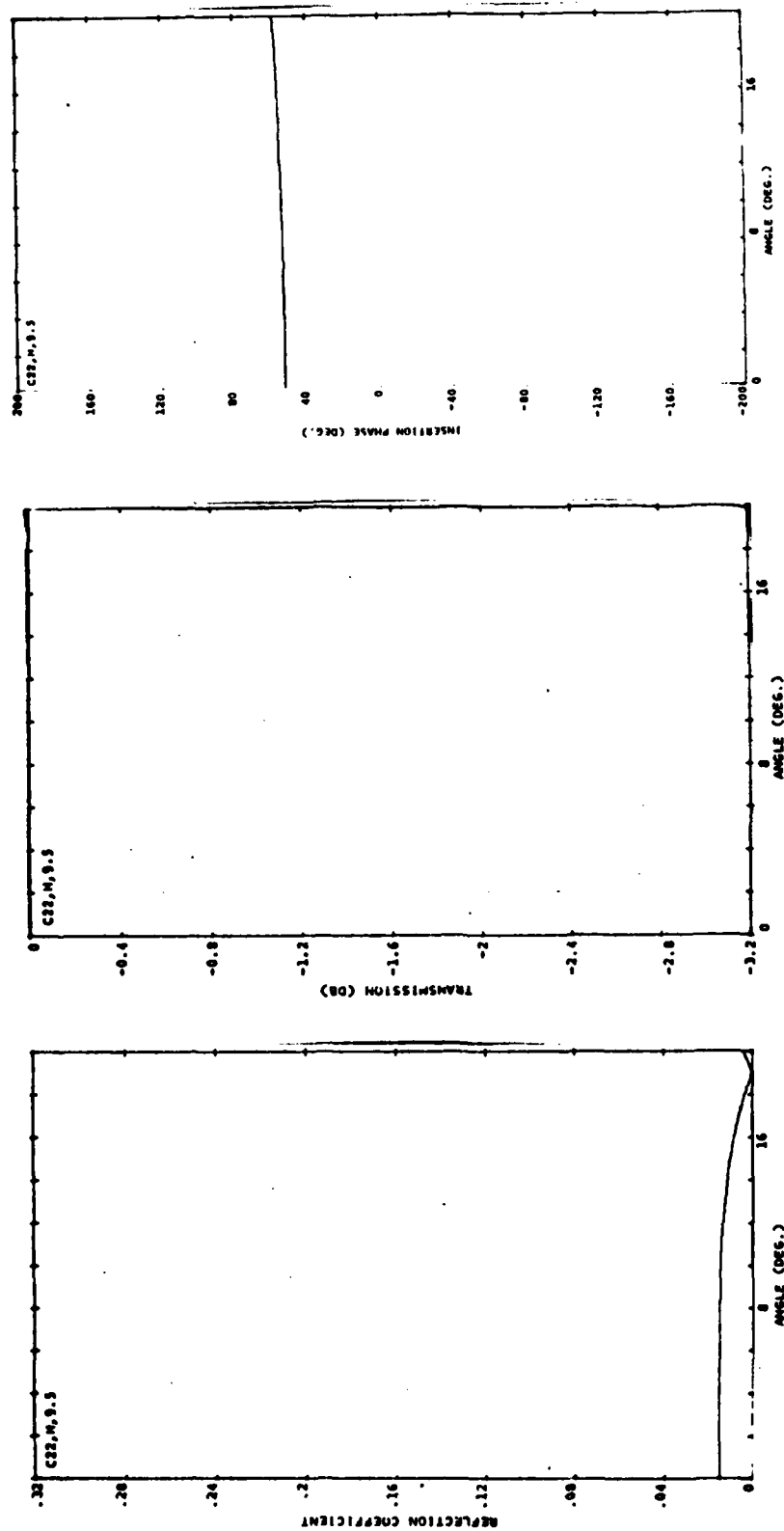


Figure A-26 Passband Reflection and Transmission, Filter C22, H Plane.

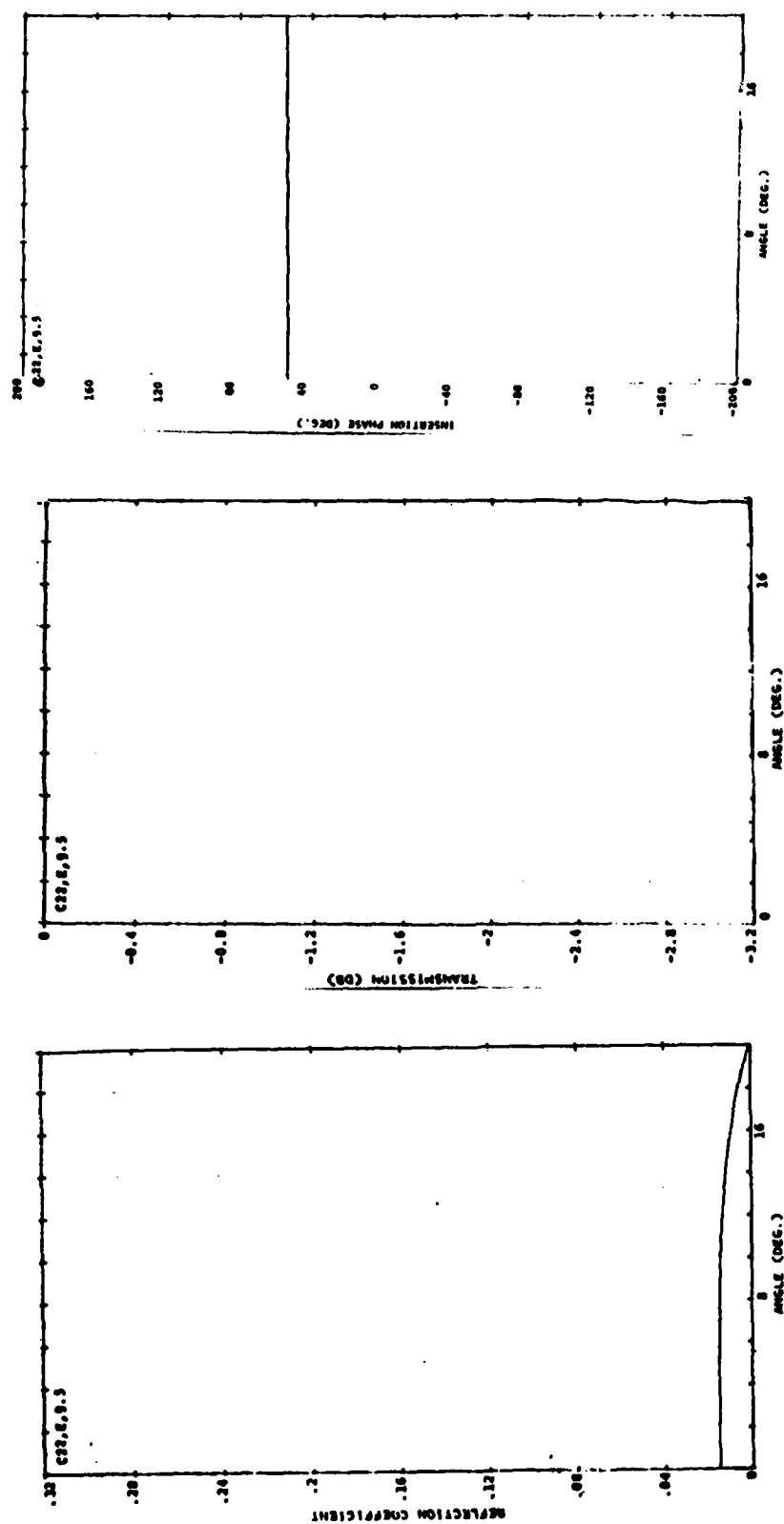


Figure A-27 Passband Reflection and Transmission, Filter C22, E Plane.

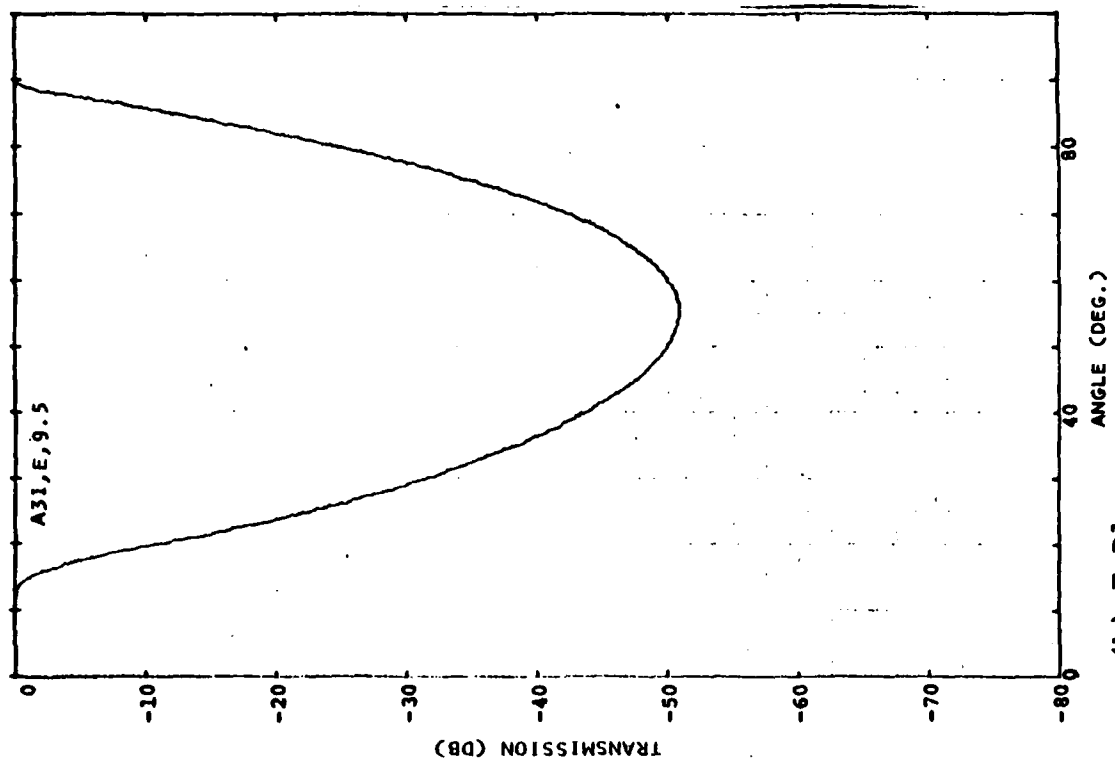
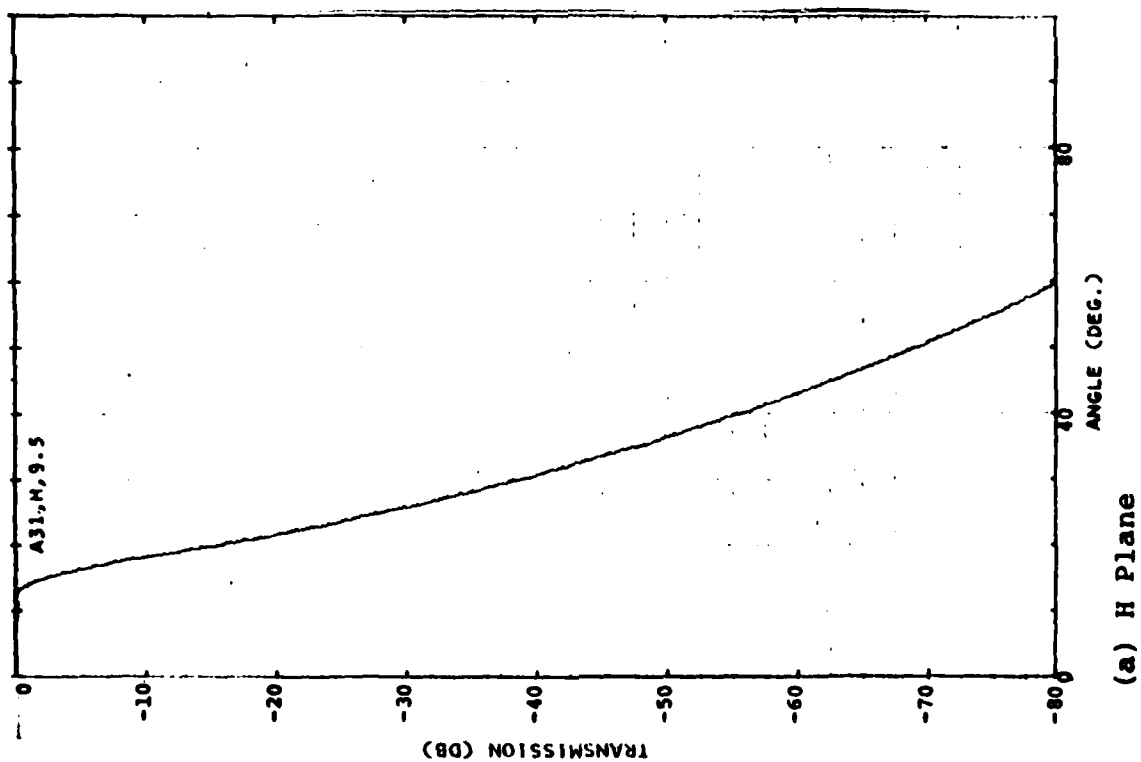


Figure A-28 Transmission, Filter A31, H and E Planes.

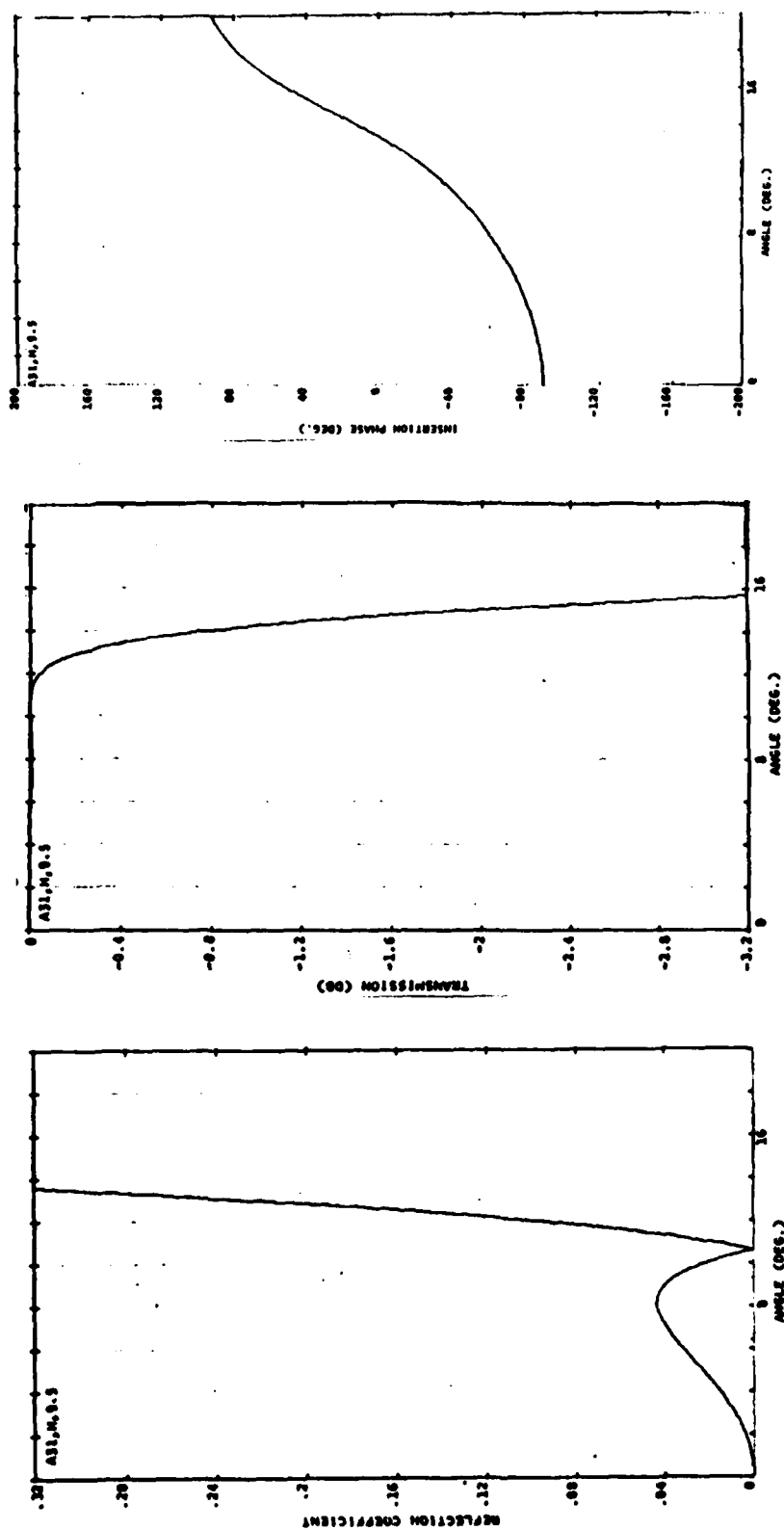


Figure A-29 Passband Reflection and Transmission, Filter A31, H Plane.

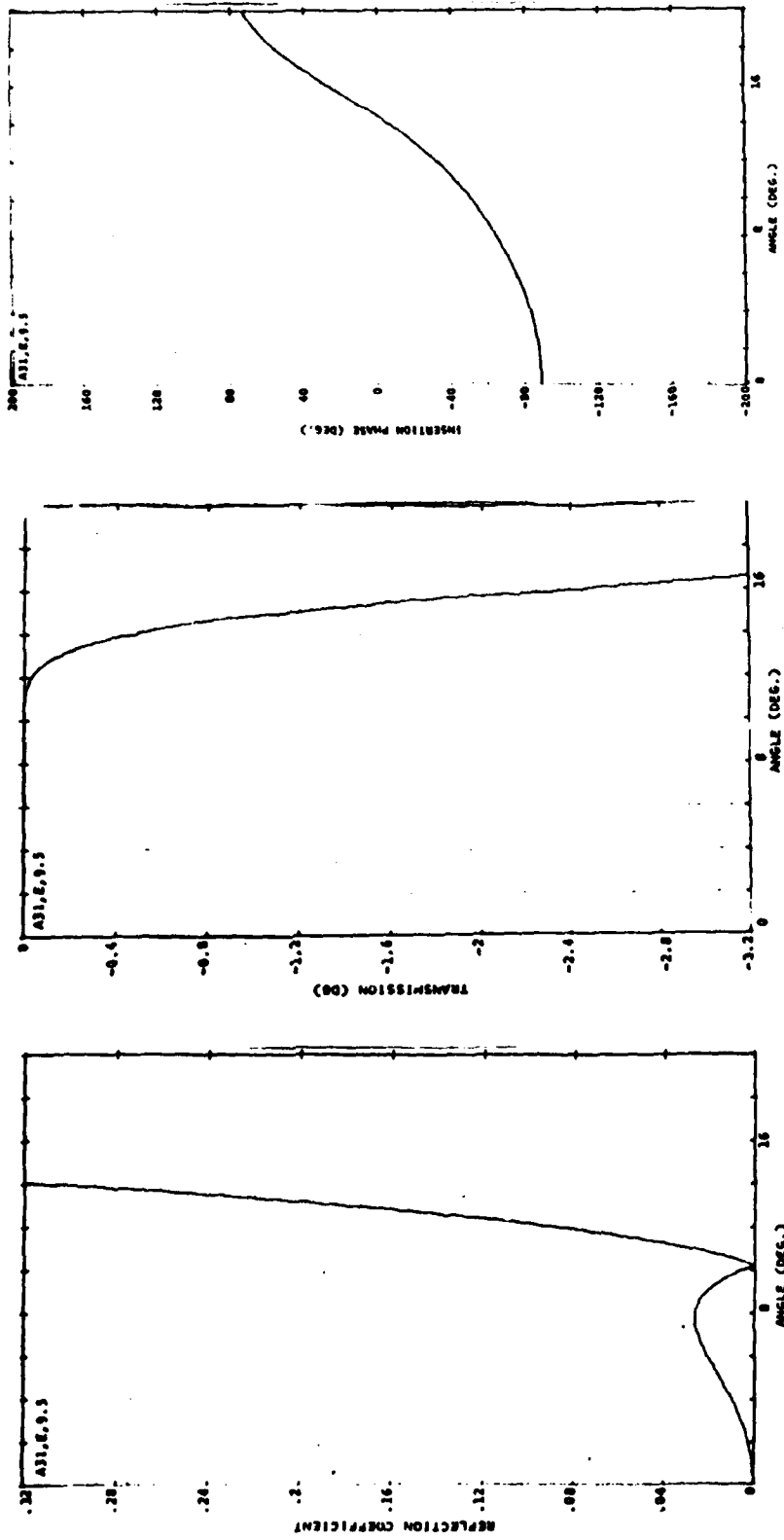
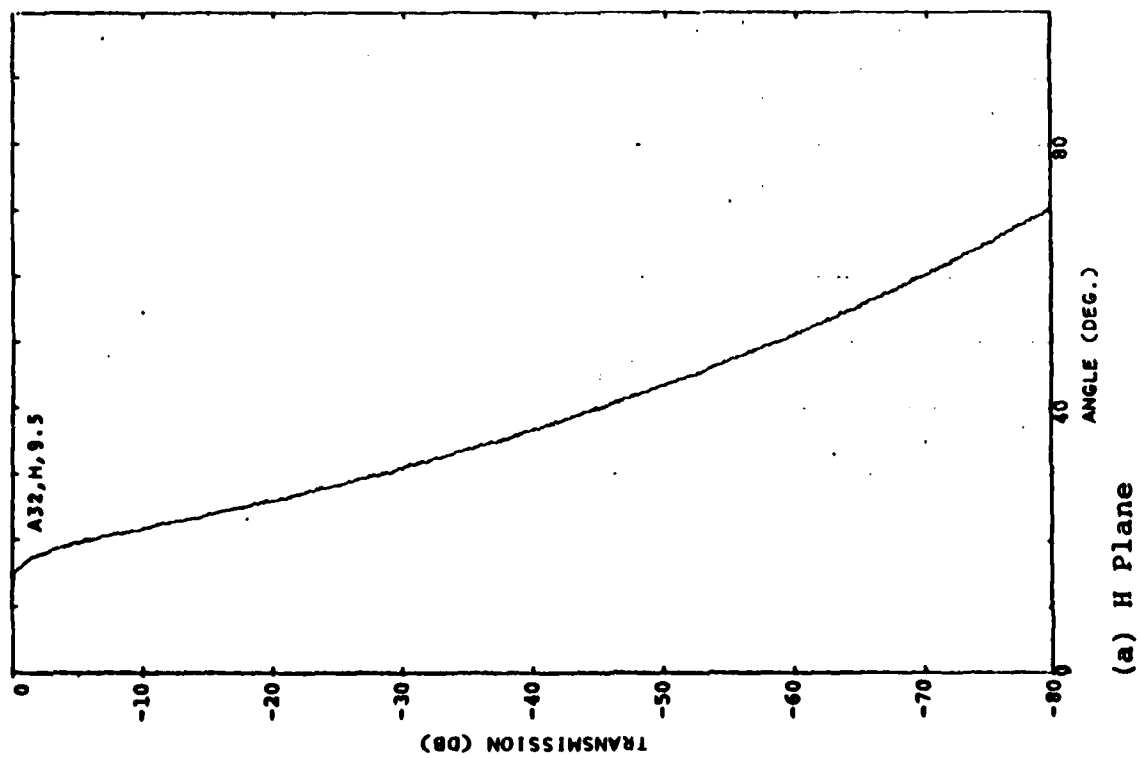
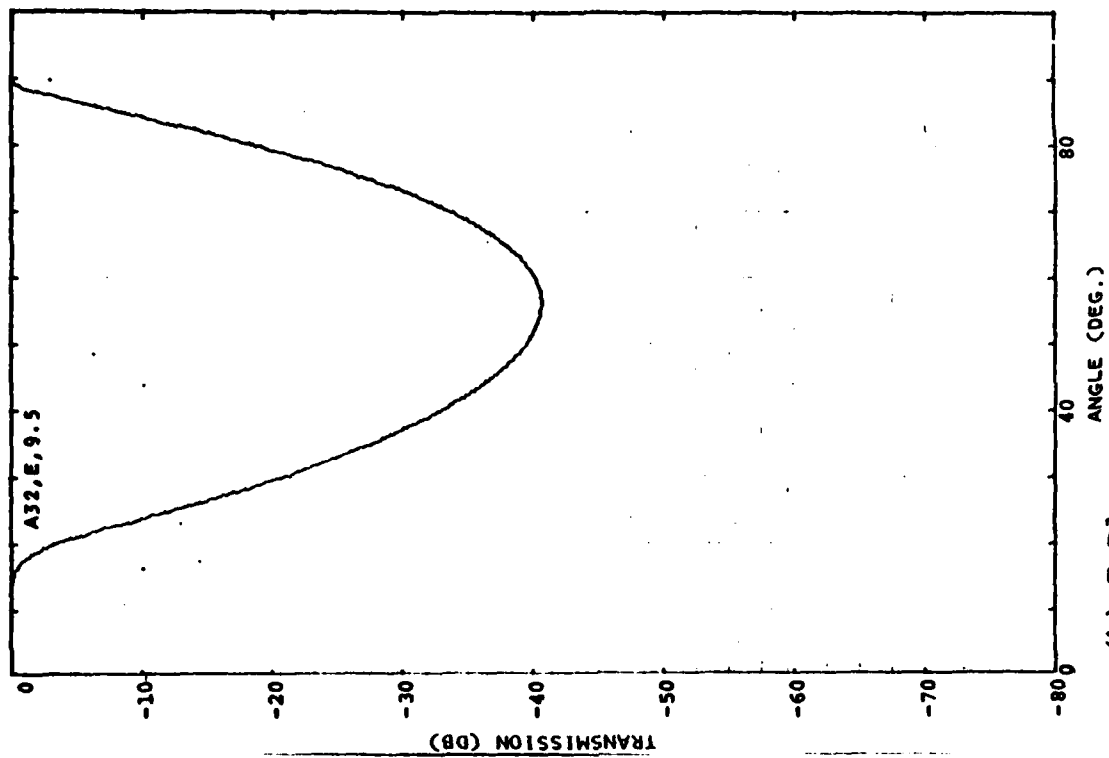


Figure A-30 Passband Reflection and Transmission, Filter A31, E Plane.



(a) H Plane



(b) E Plane

Figure A-31 Transmission, Filter A32, H and E Planes.

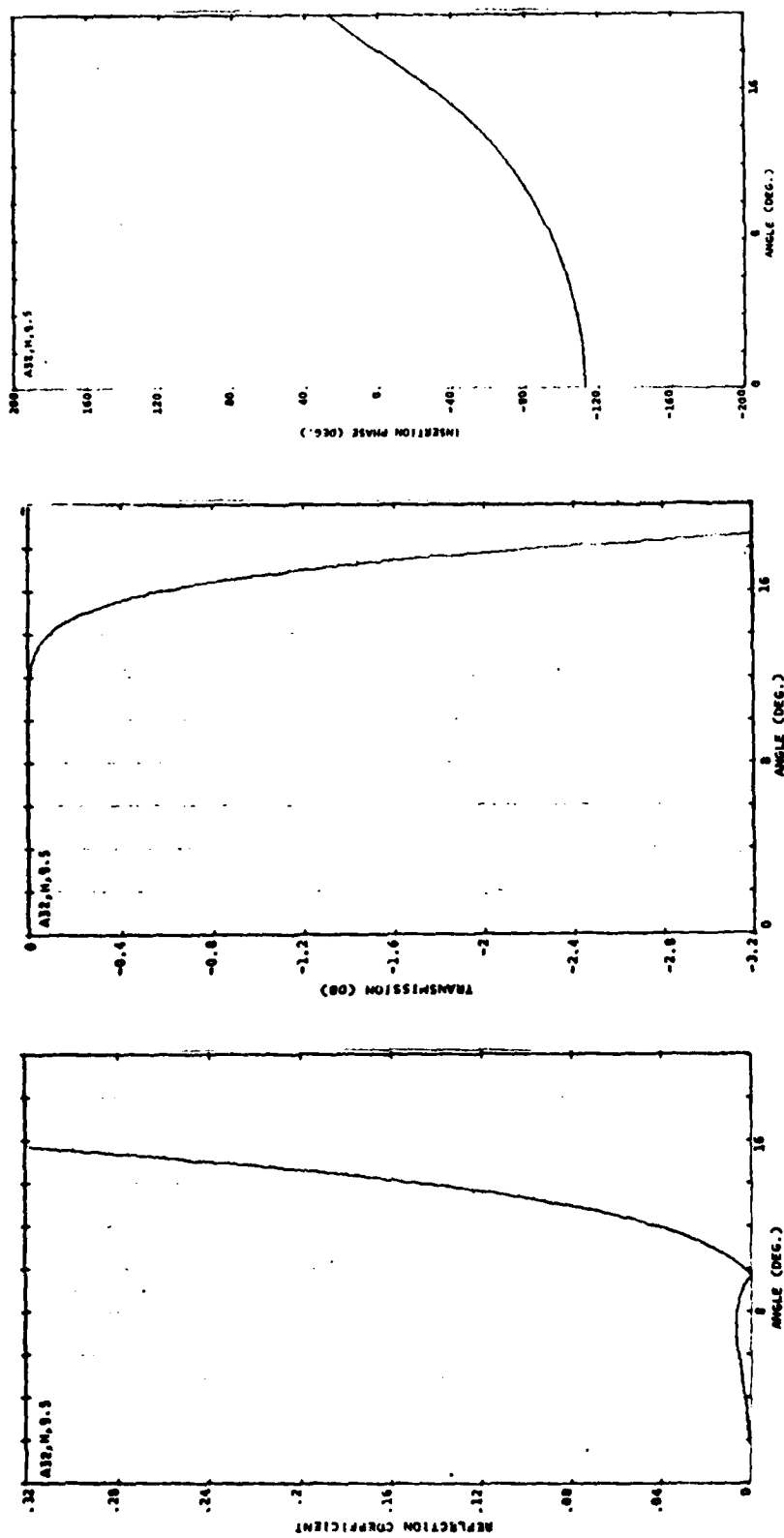


Figure A-32 Passband Reflection and Transmission, Filter A32, H Plane.

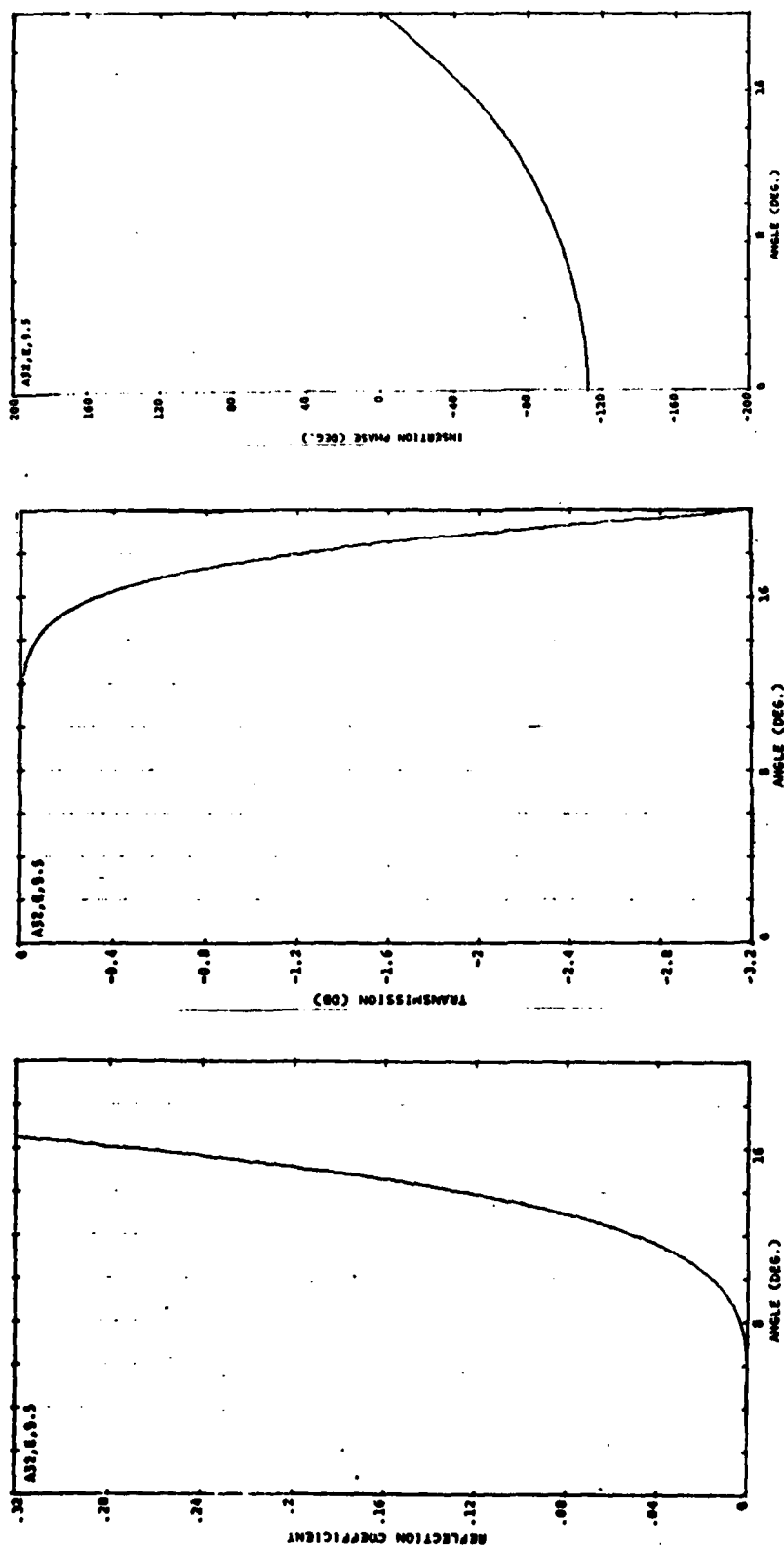
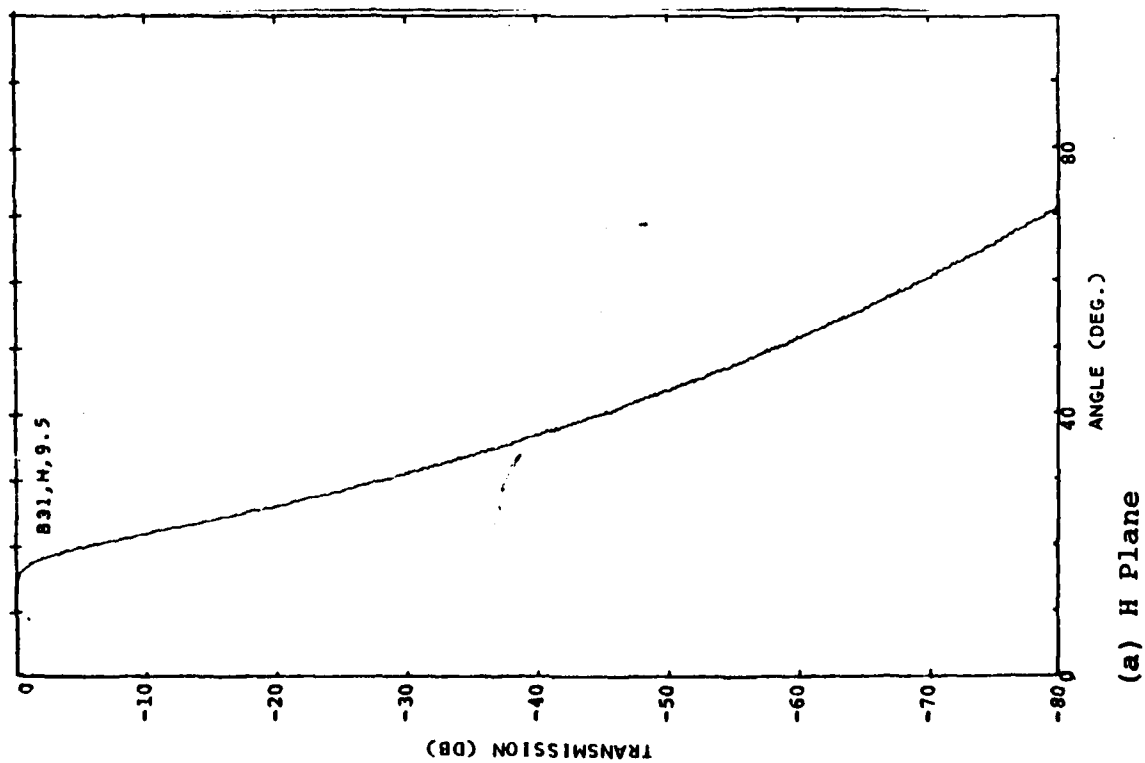
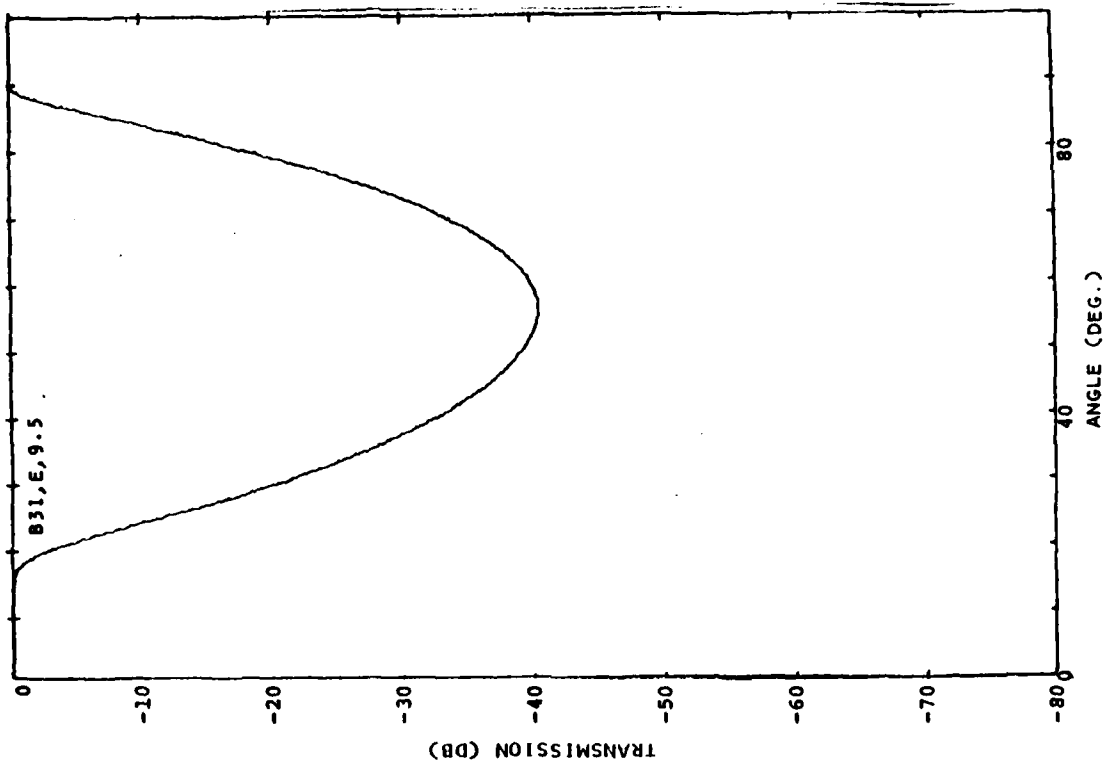


Figure A-33 Passband Reflection and Transmission, Filter A32, E Plane.



(a) H Plane



(b) E Plane

Figure A-34 Transmission, Filter B31, H and E Planes.

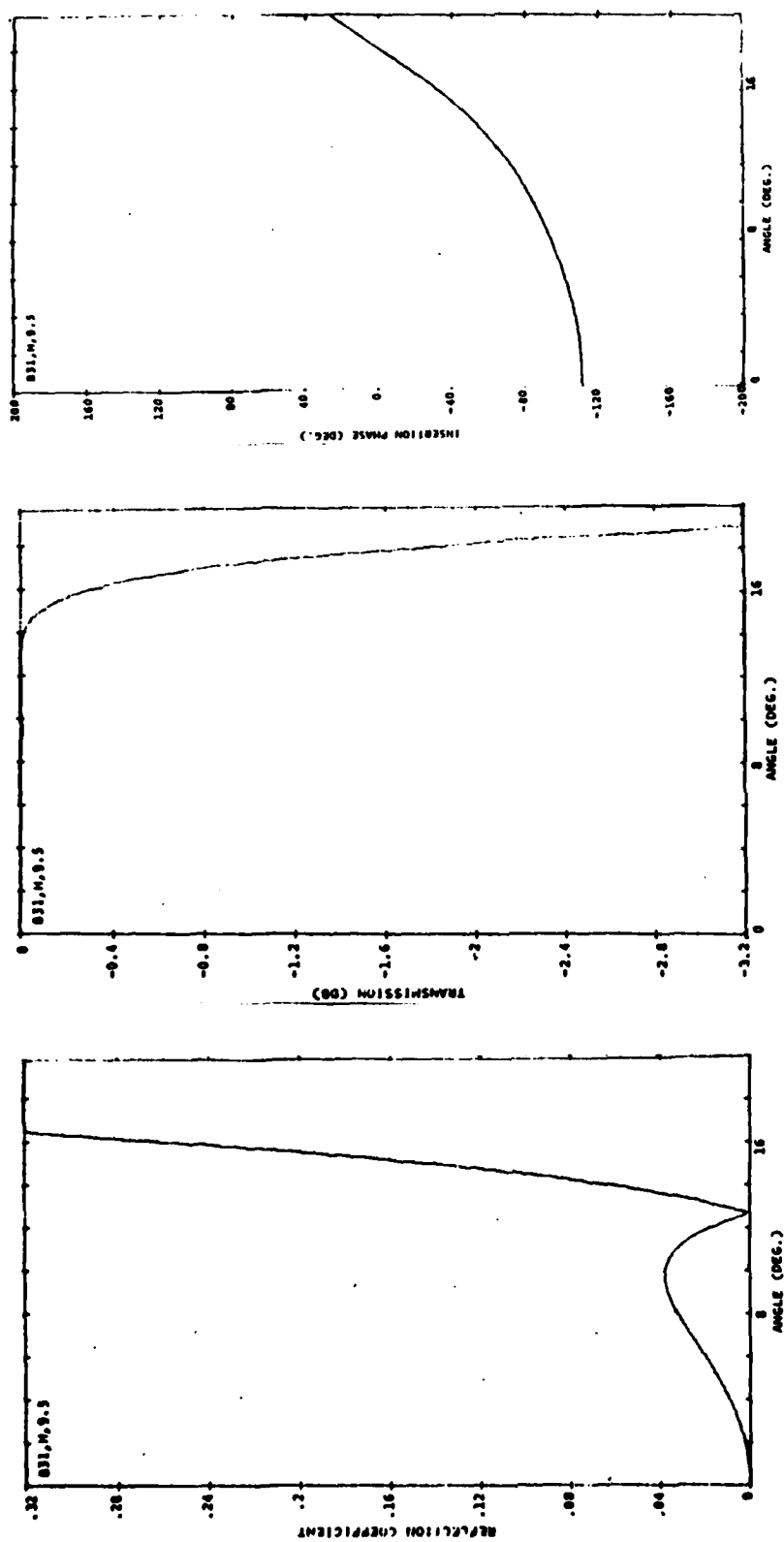


Figure A-35 Passband Reflection and Transmission, Filter B31, H Plane.

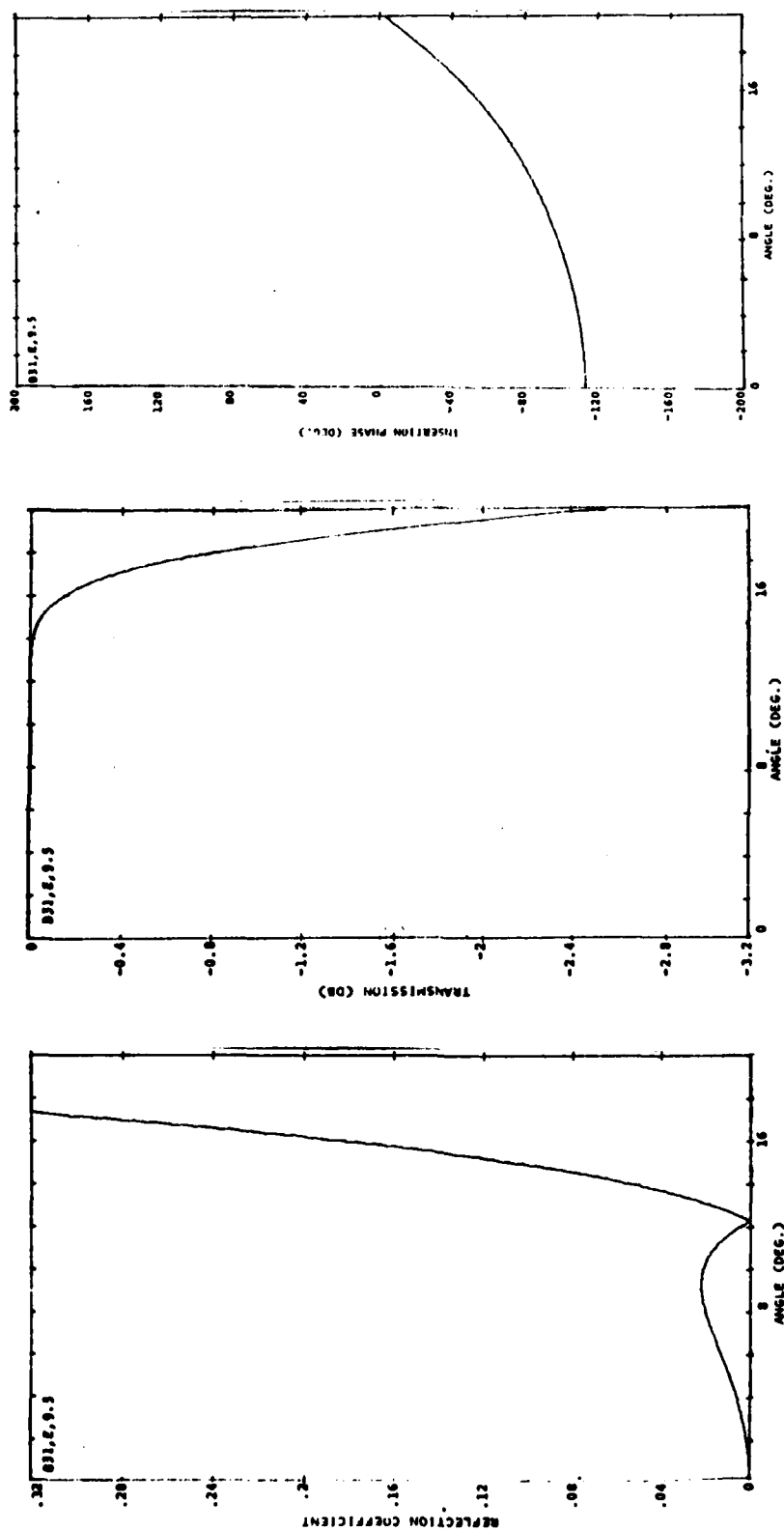


Figure A-36 Passband Reflection and Transmission, Filter B31, E Plane.

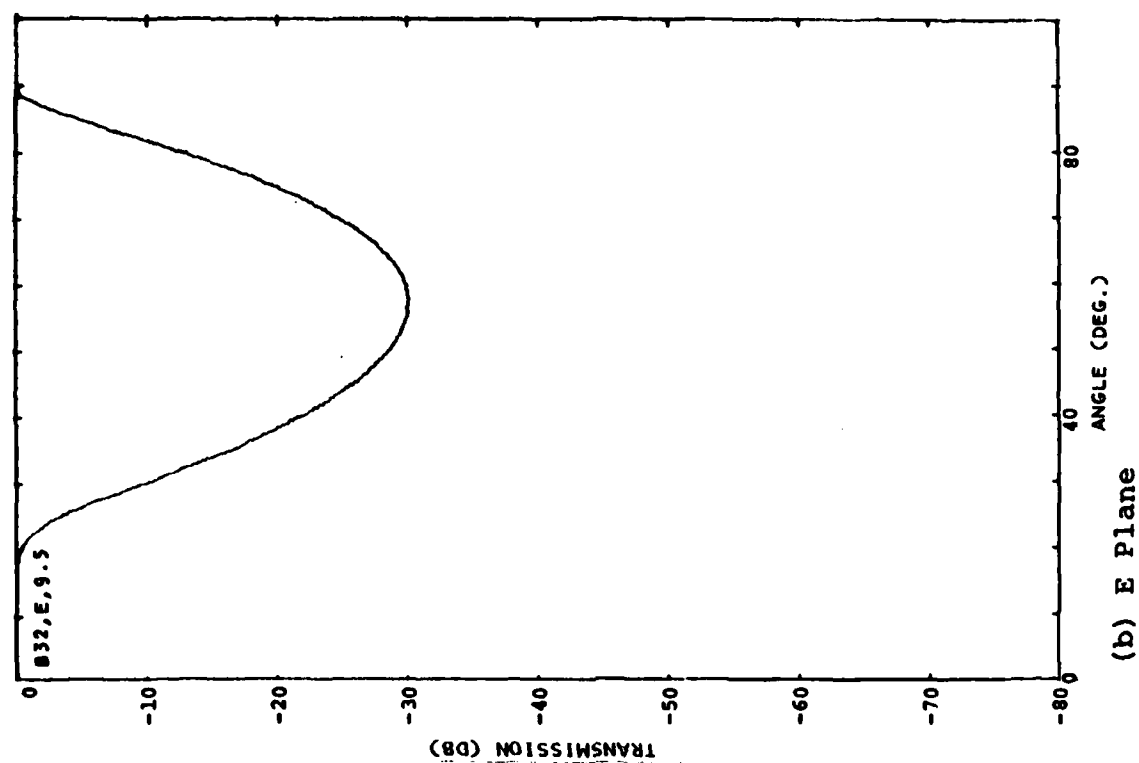
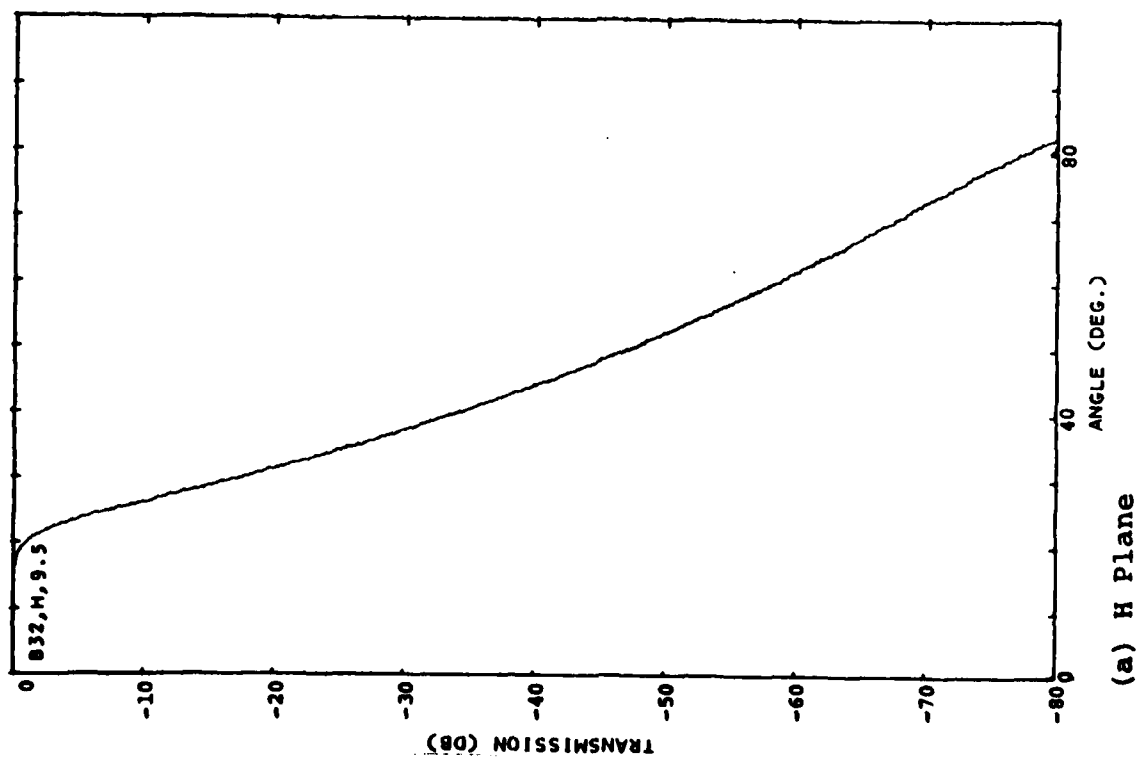


Figure A-37 Transmission, Filter B32, H and E Planes.

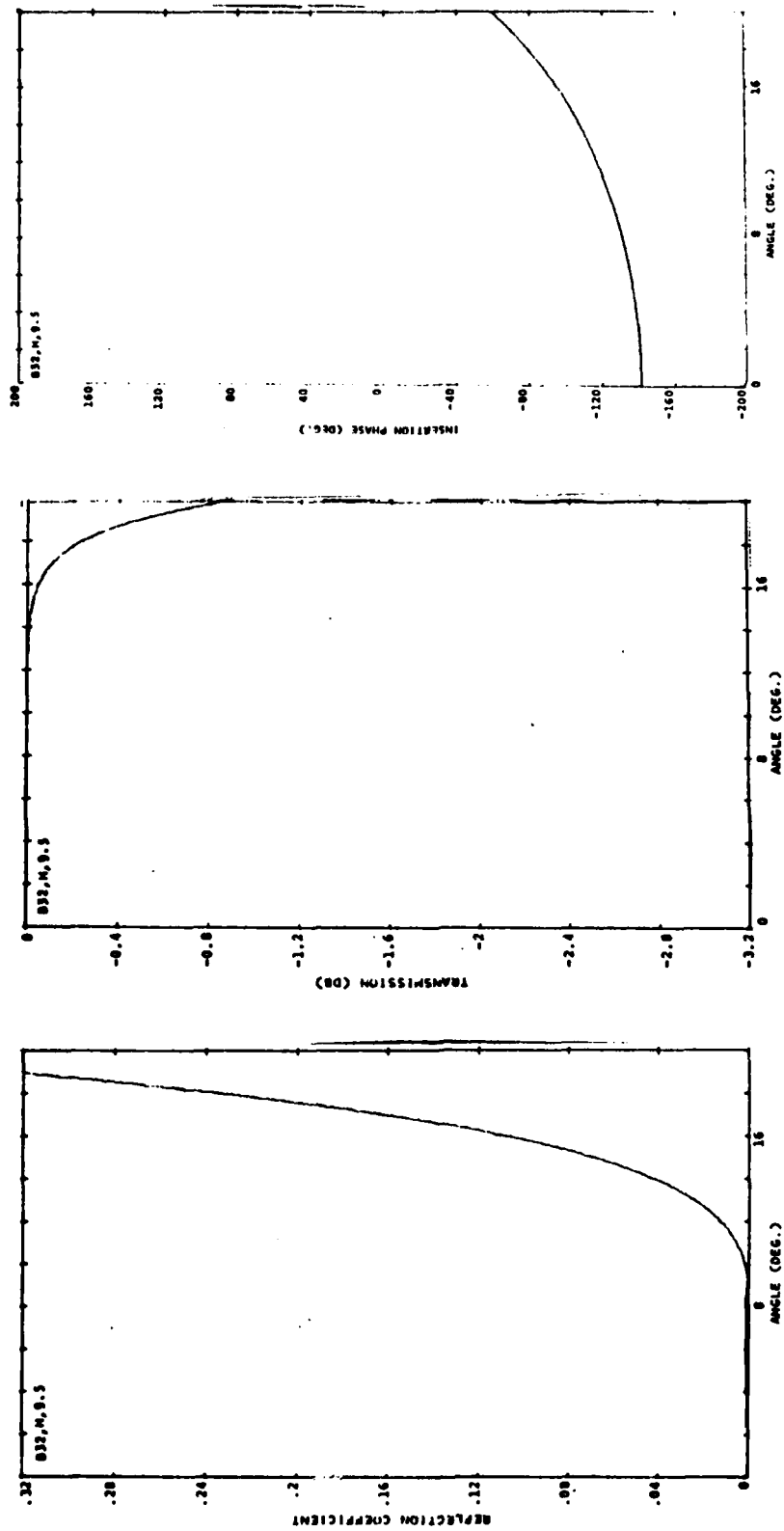


Figure A-38 Passband Reflection and Transmission, Filter B32, H Plane.

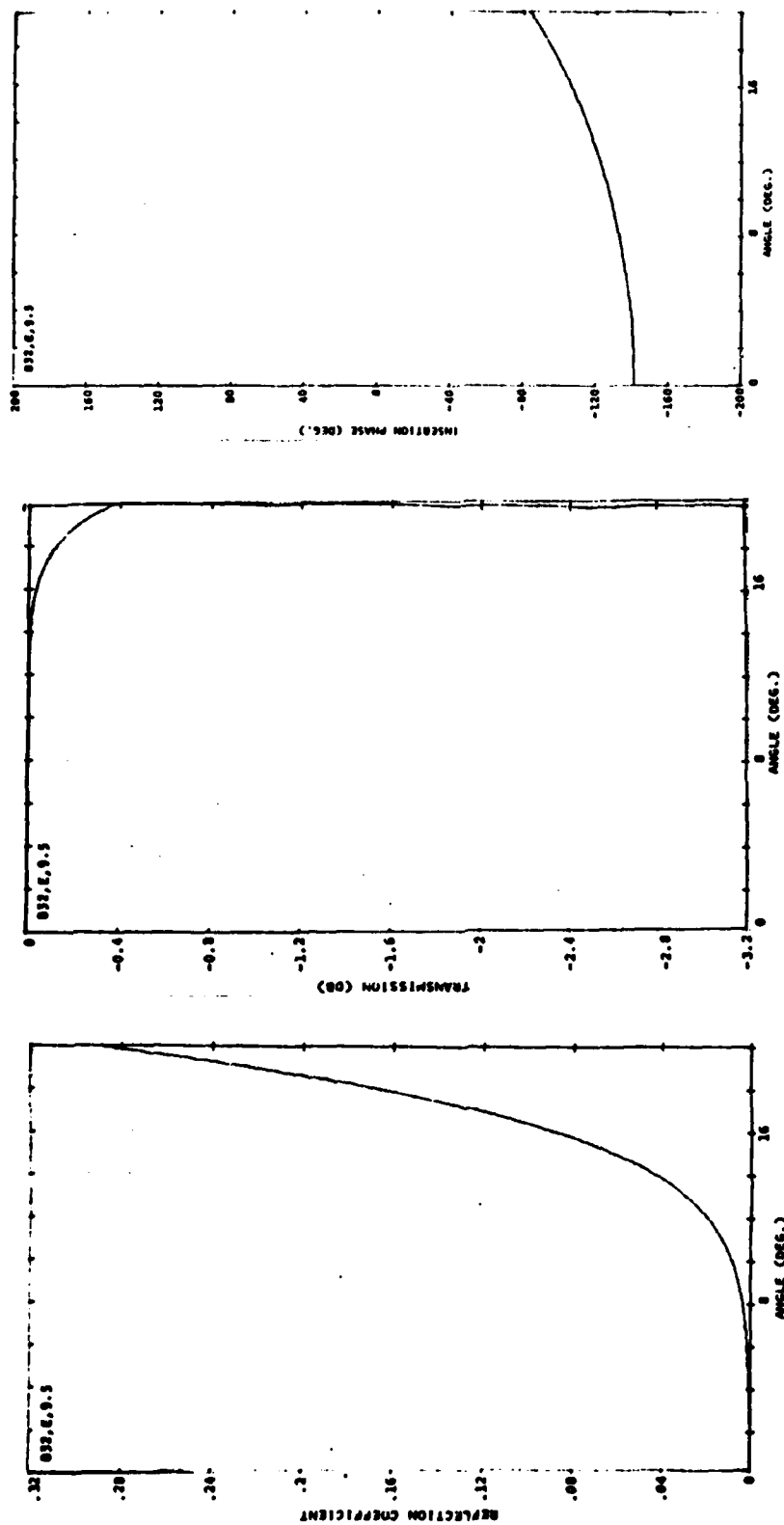
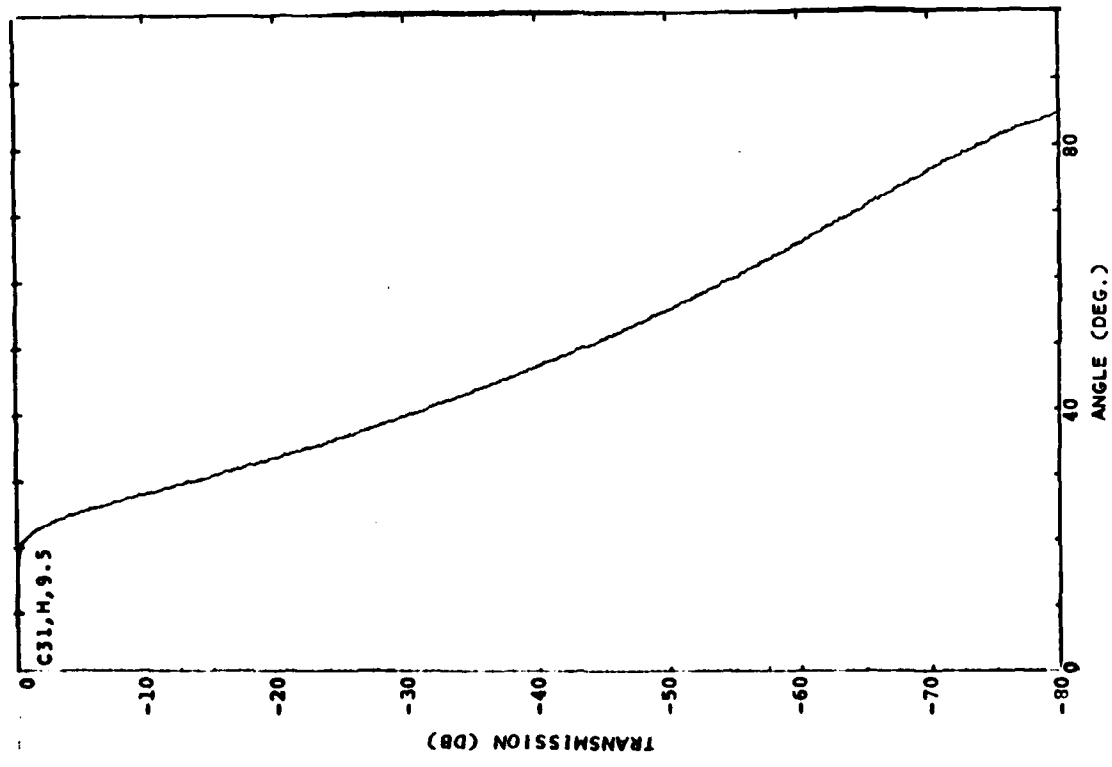
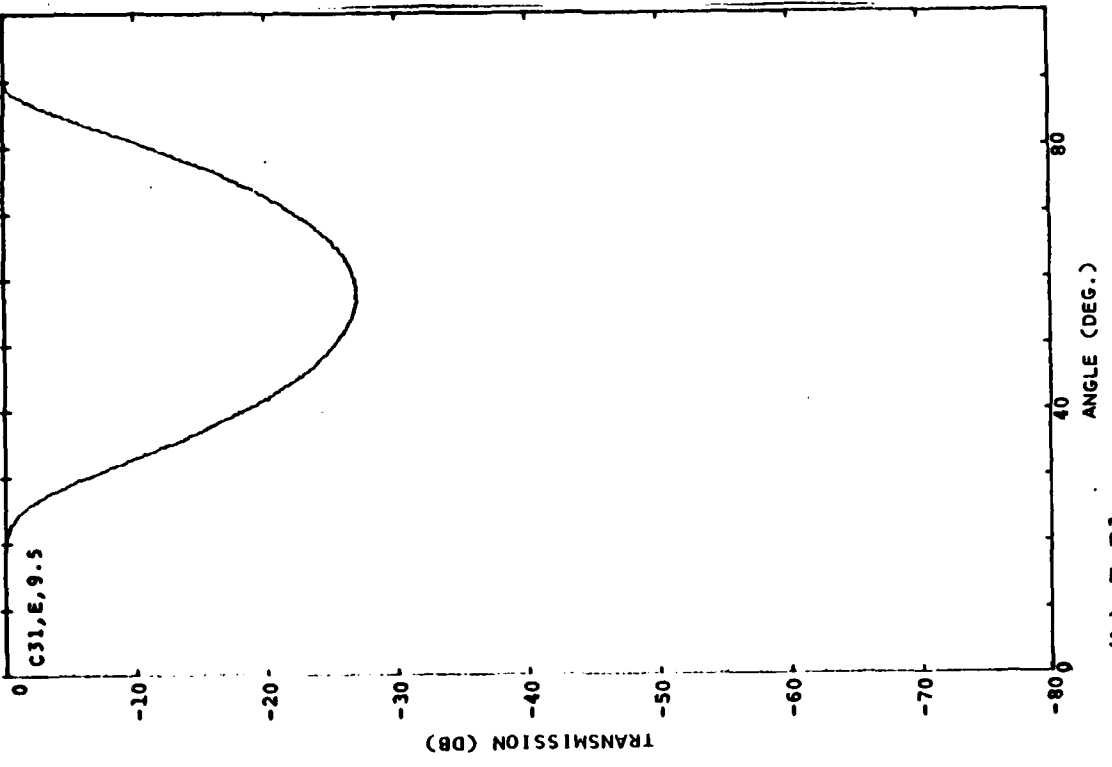


Figure A-39 Passband Reflection and Transmission, Filter B32, E Plane.



(a) H Plane



(b) E Plane

Figure A-40 Transmission, Filter C31, H and E Planes.

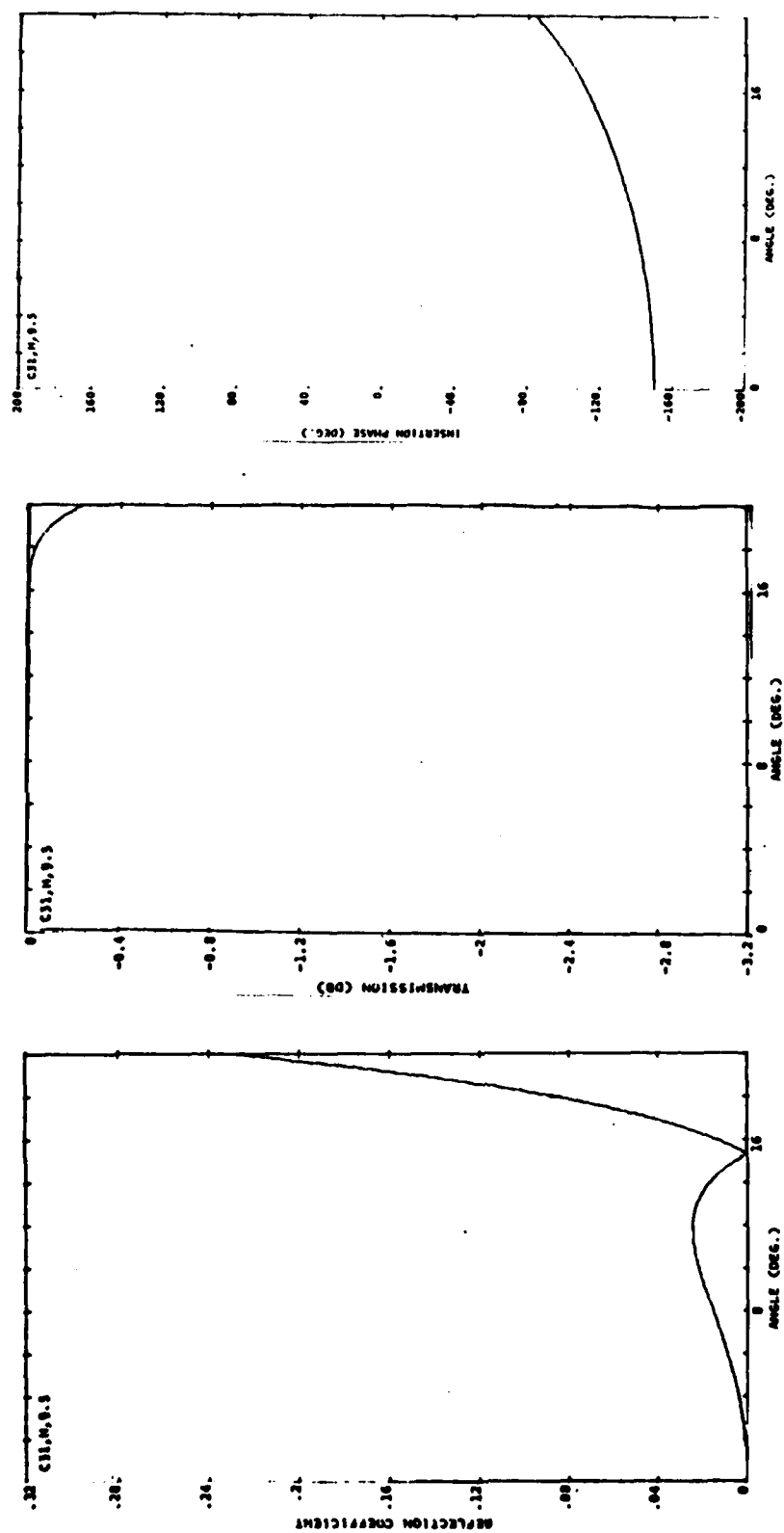


Figure A-41 Passband Reflection and Transmission, Filter C31, H Plane.

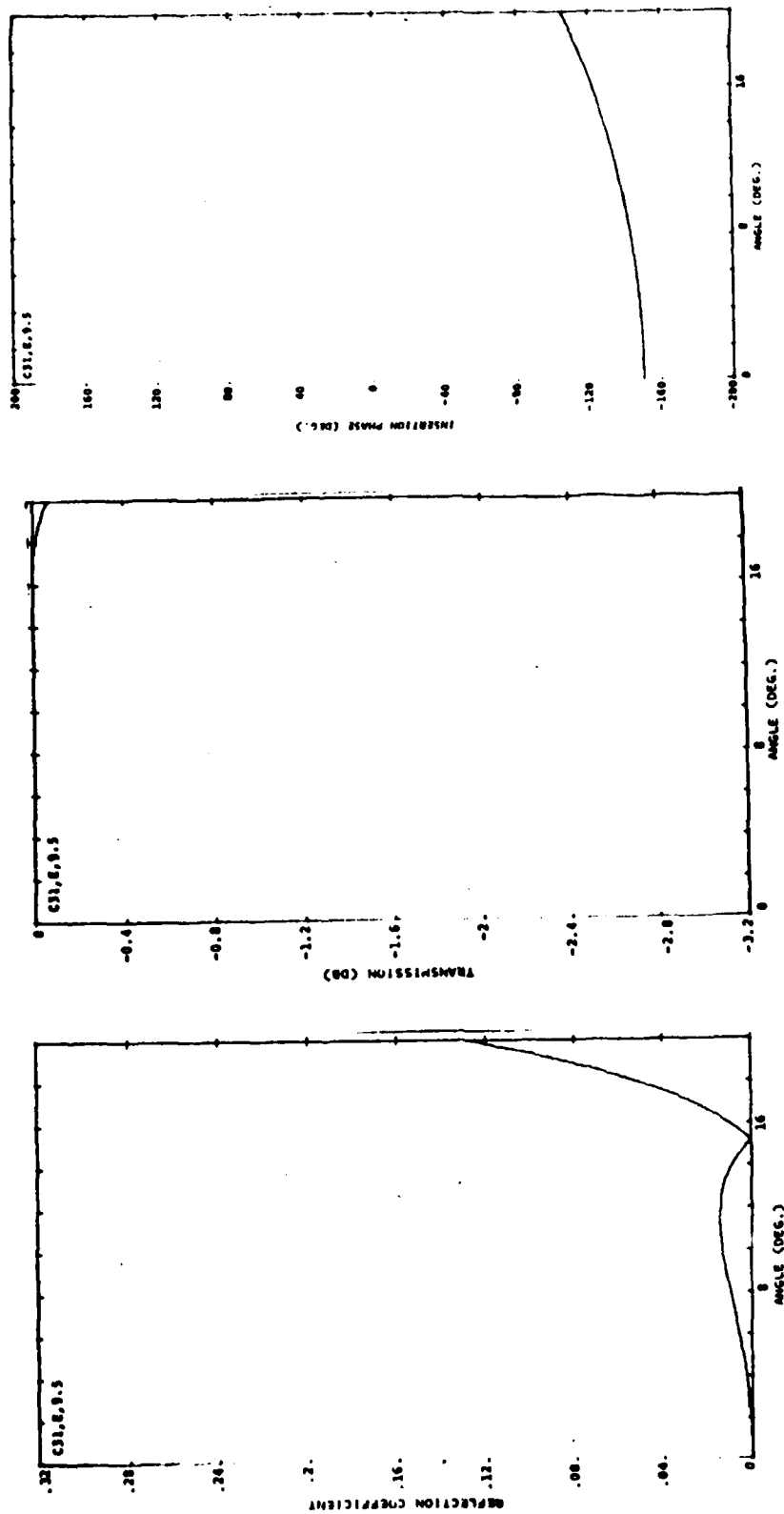
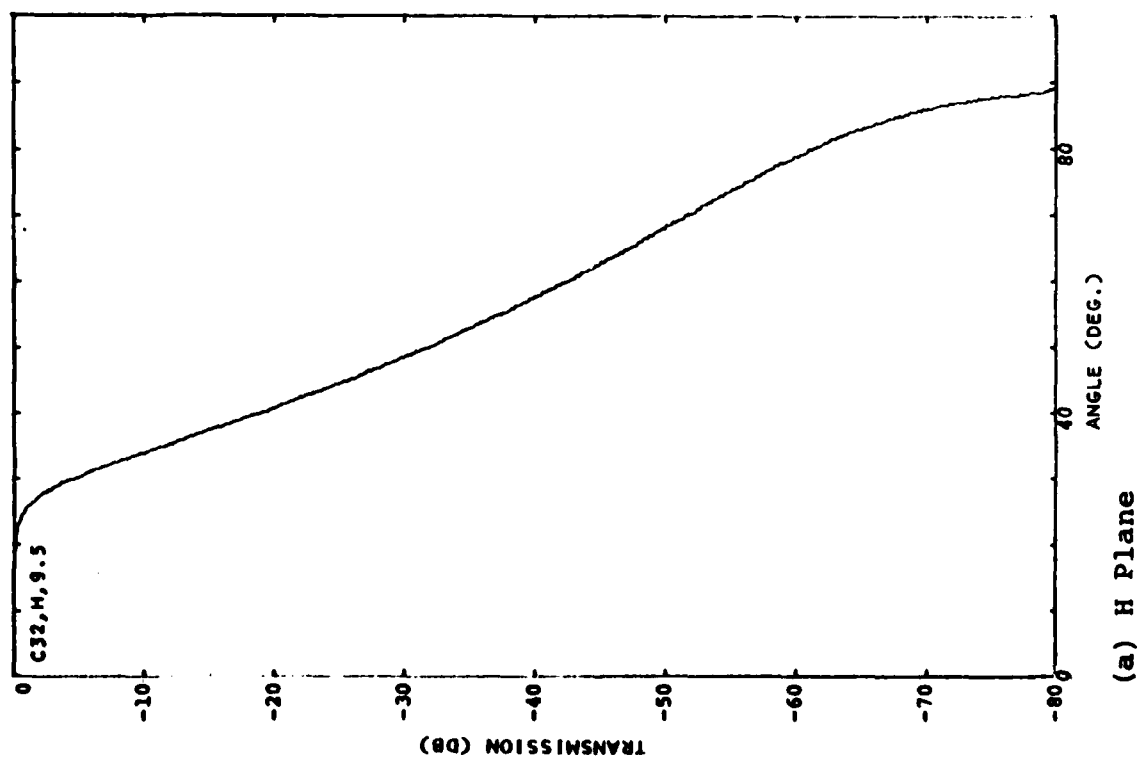
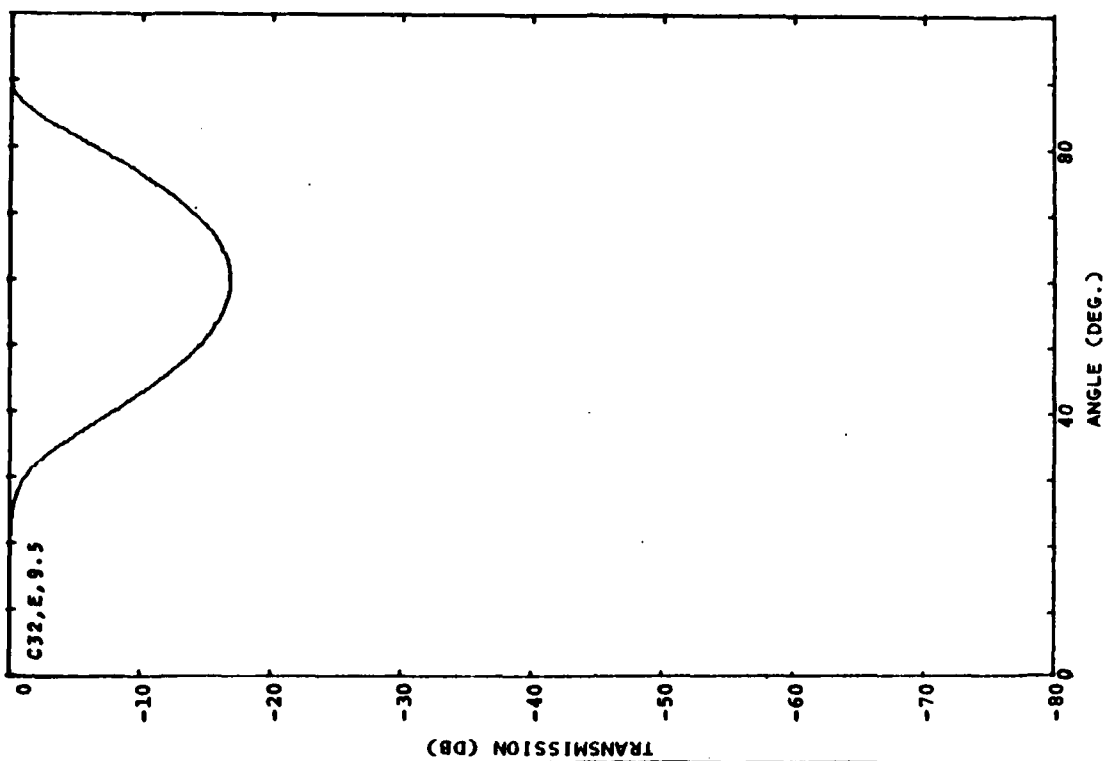


Figure A-42 Passband Reflection and Transmission, Filter C31, E Plane.



(a) H Plane



(b) E Plane

Figure A-43 Transmission, Filter C32, H and E Planes.

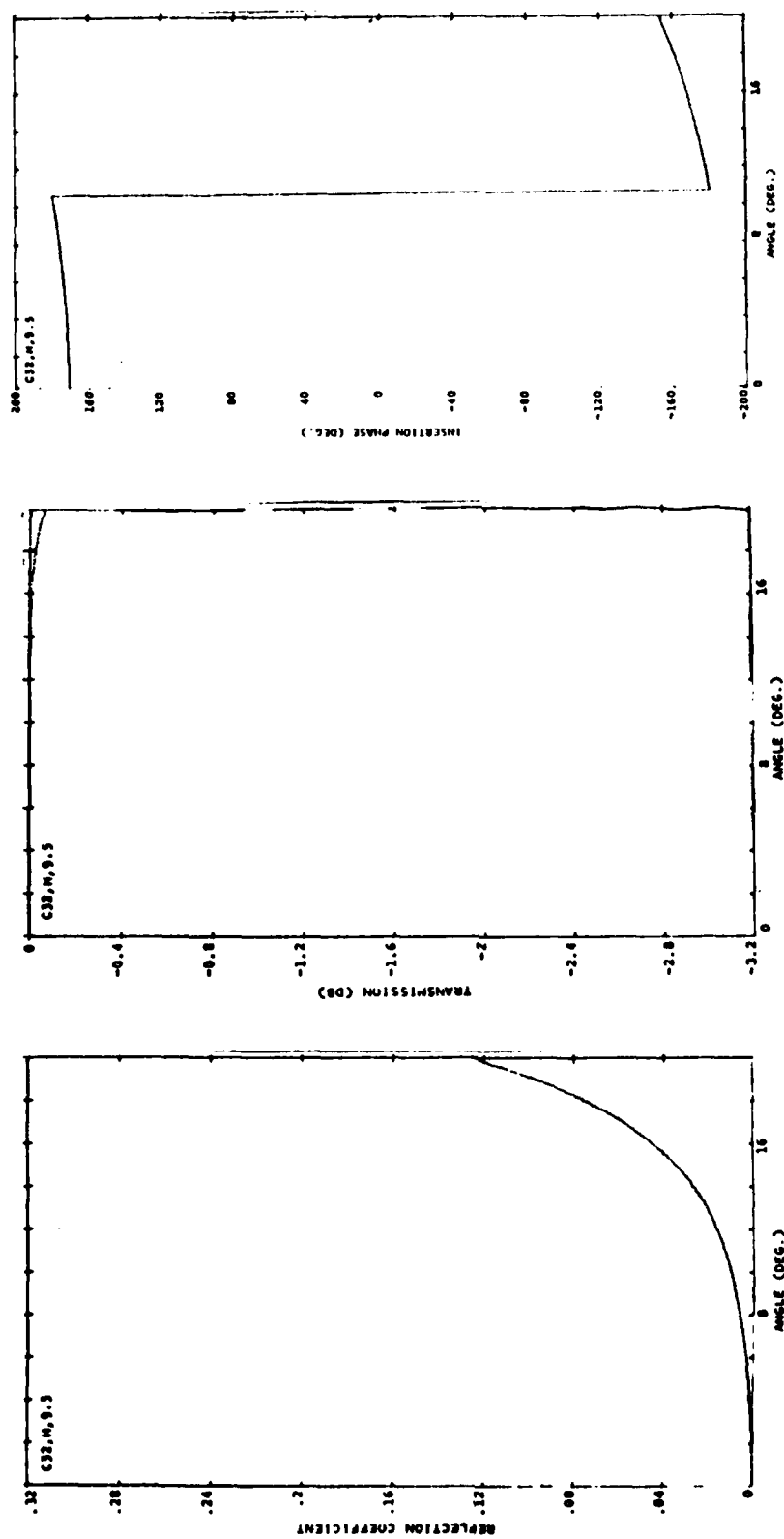


Figure A-44 Passband Reflection and Transmission, Filter C32, H Plane.

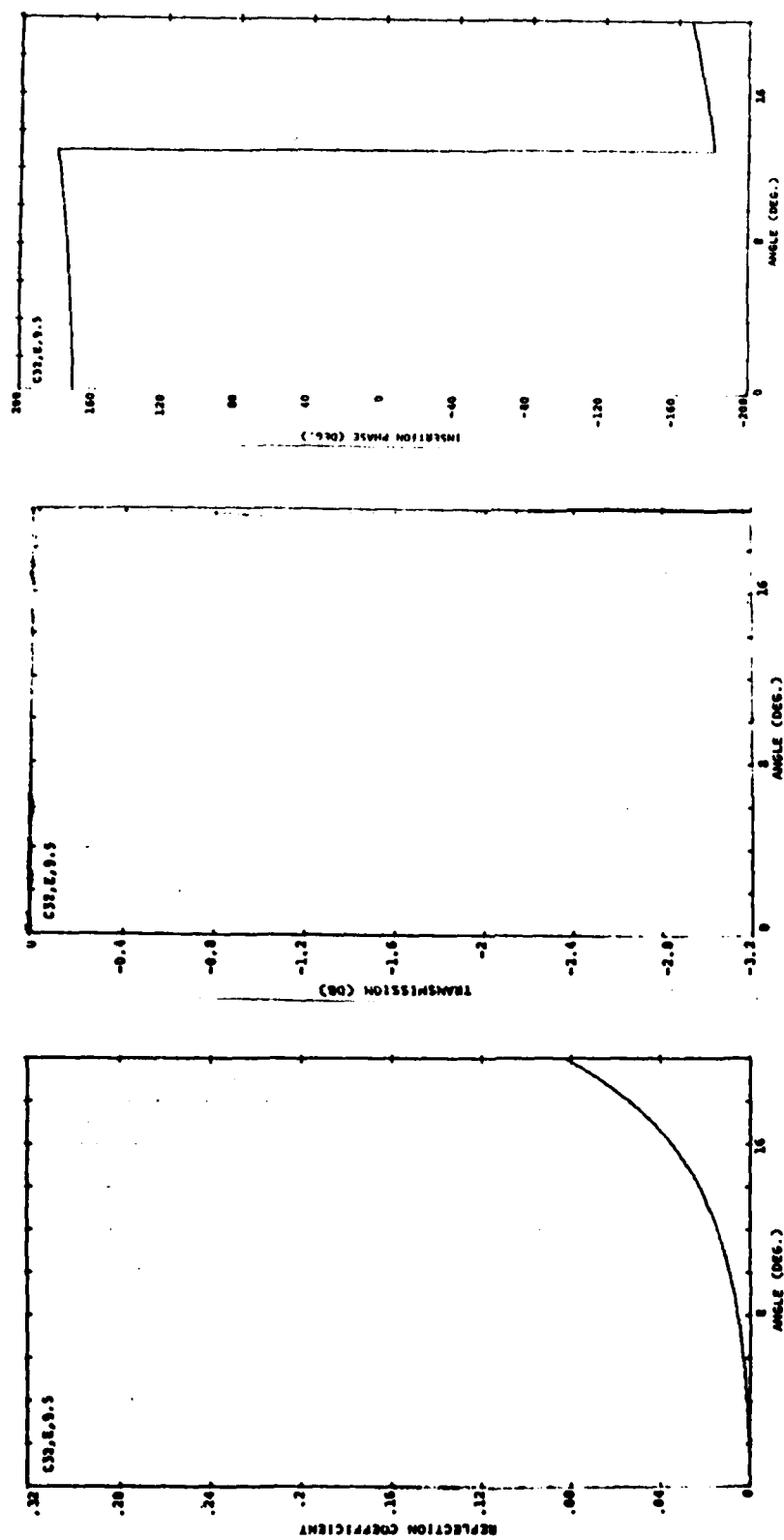


Figure A-45 Passband Reflection and Transmission, Filter C32, E Plane.

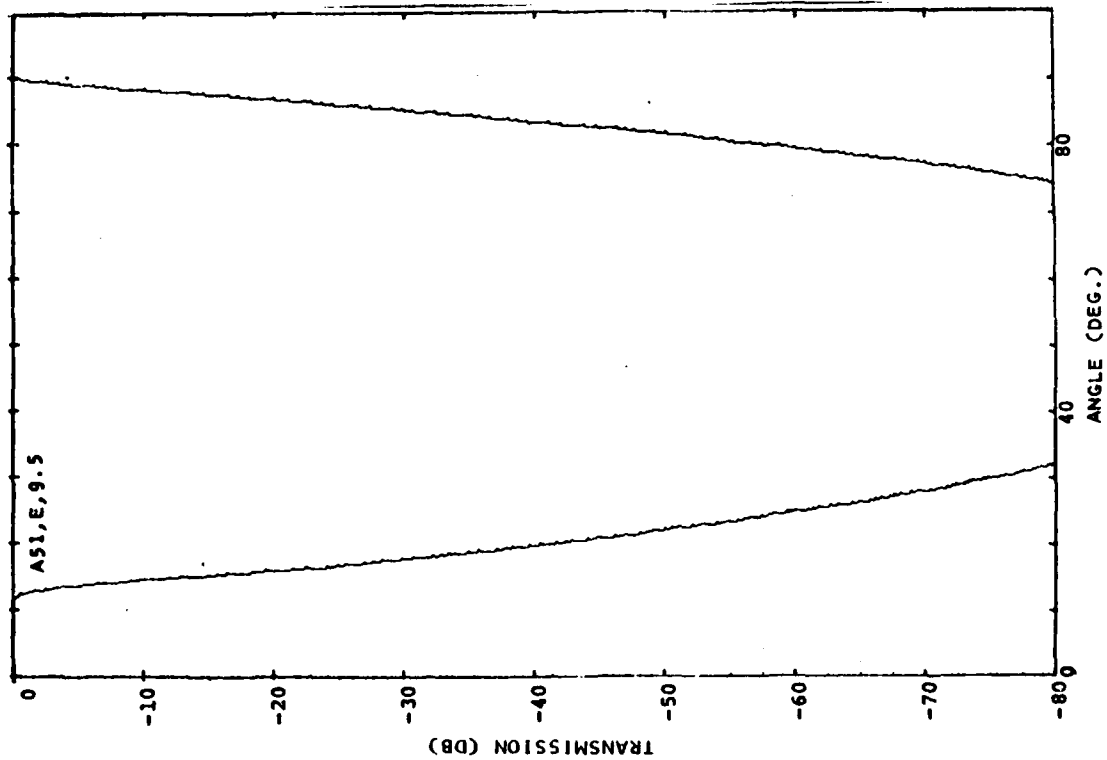
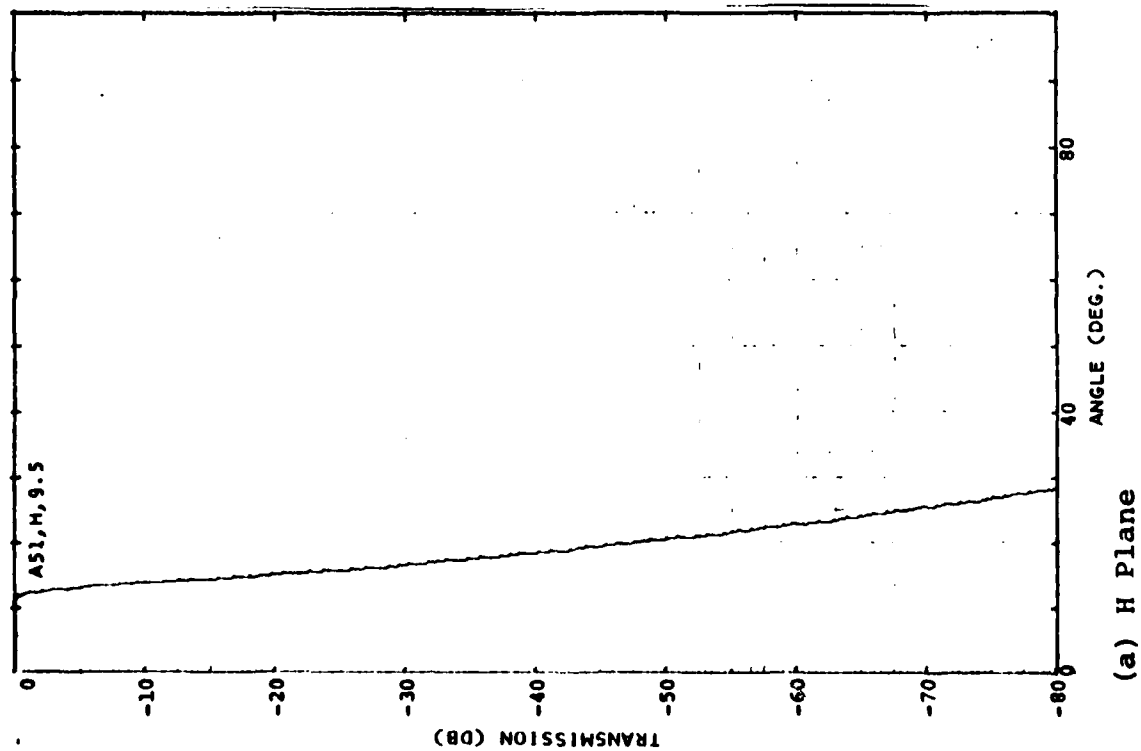


Figure A-46 Transmission, Filter A51, H and E Planes.

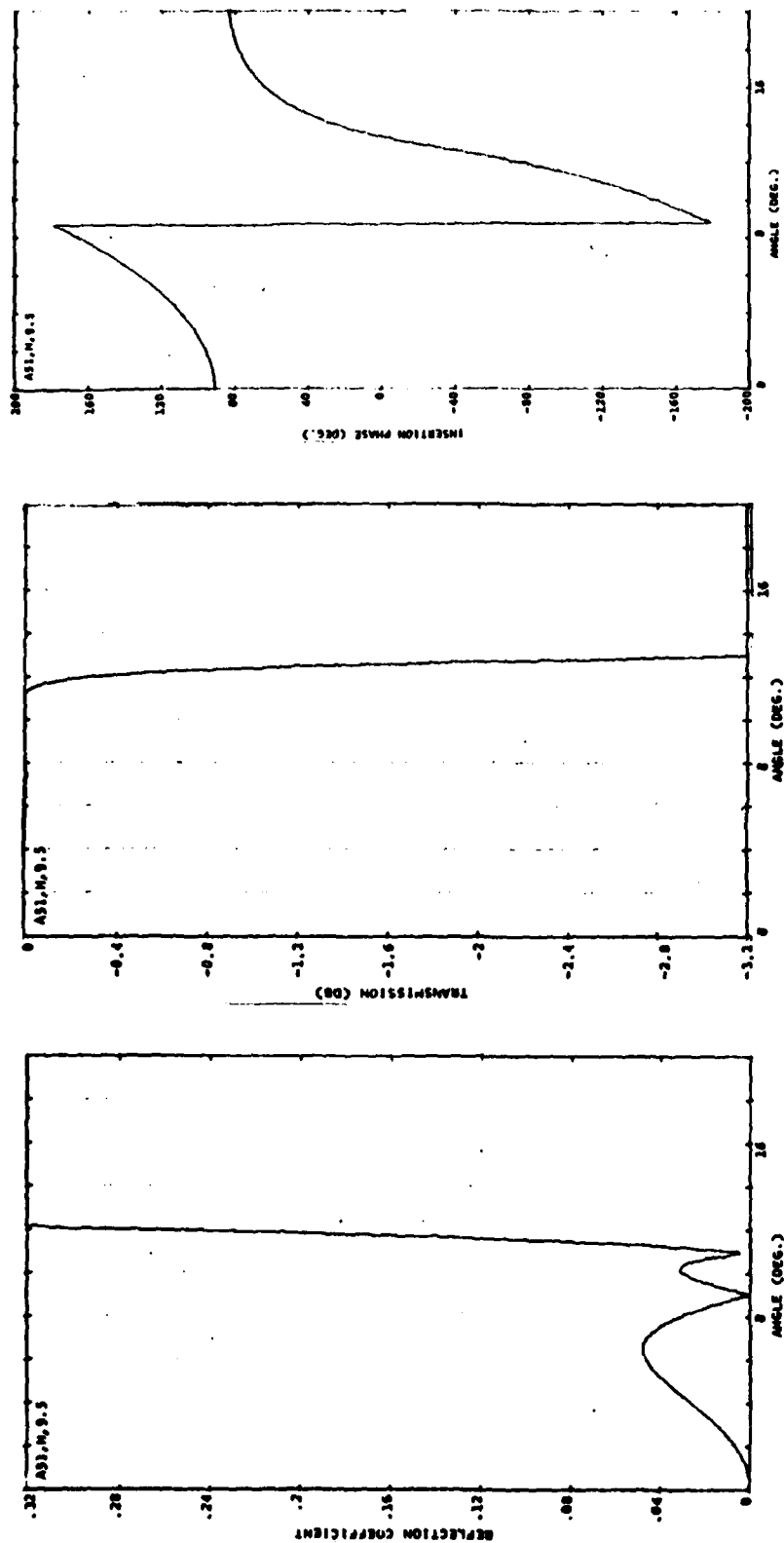


Figure A-47 Passband Reflection and Transmission, Filter A51, H Plane.

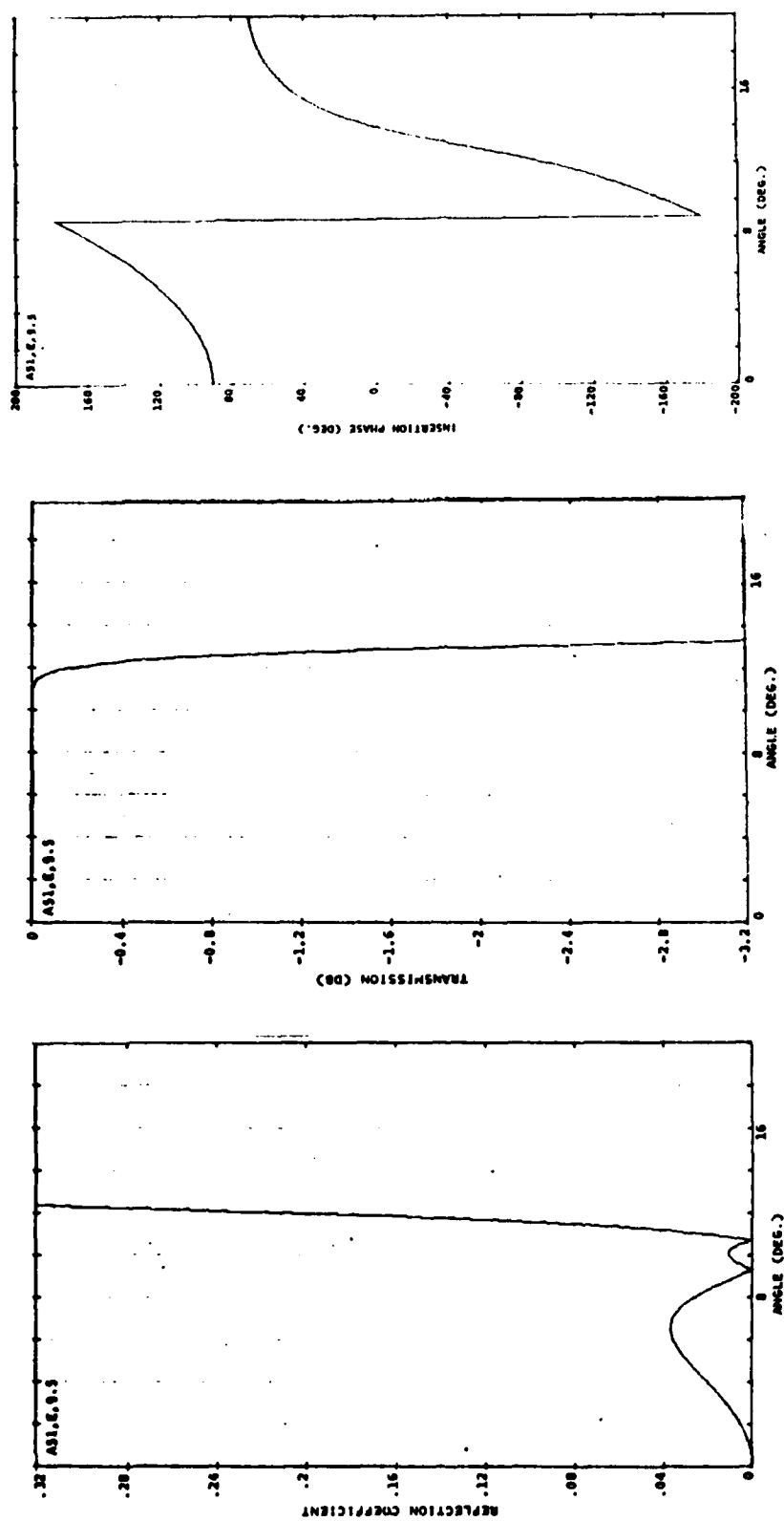


Figure A-48 Passband Reflection and Transmission, Filter A51, E Plane.

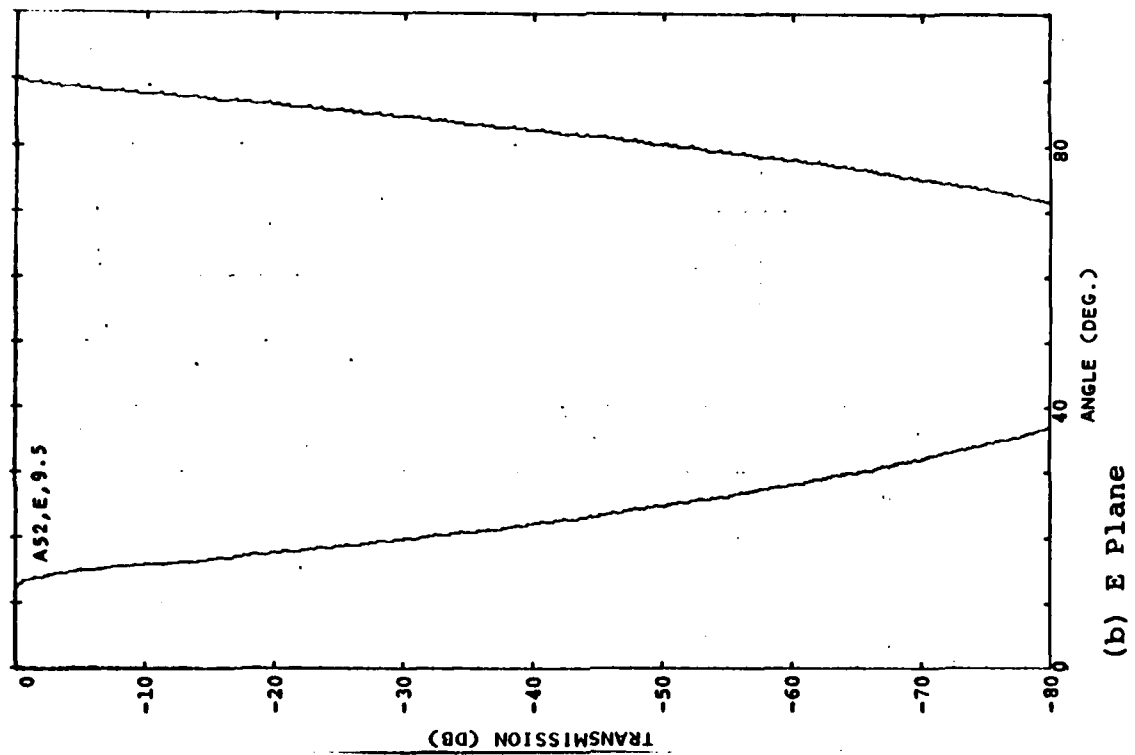
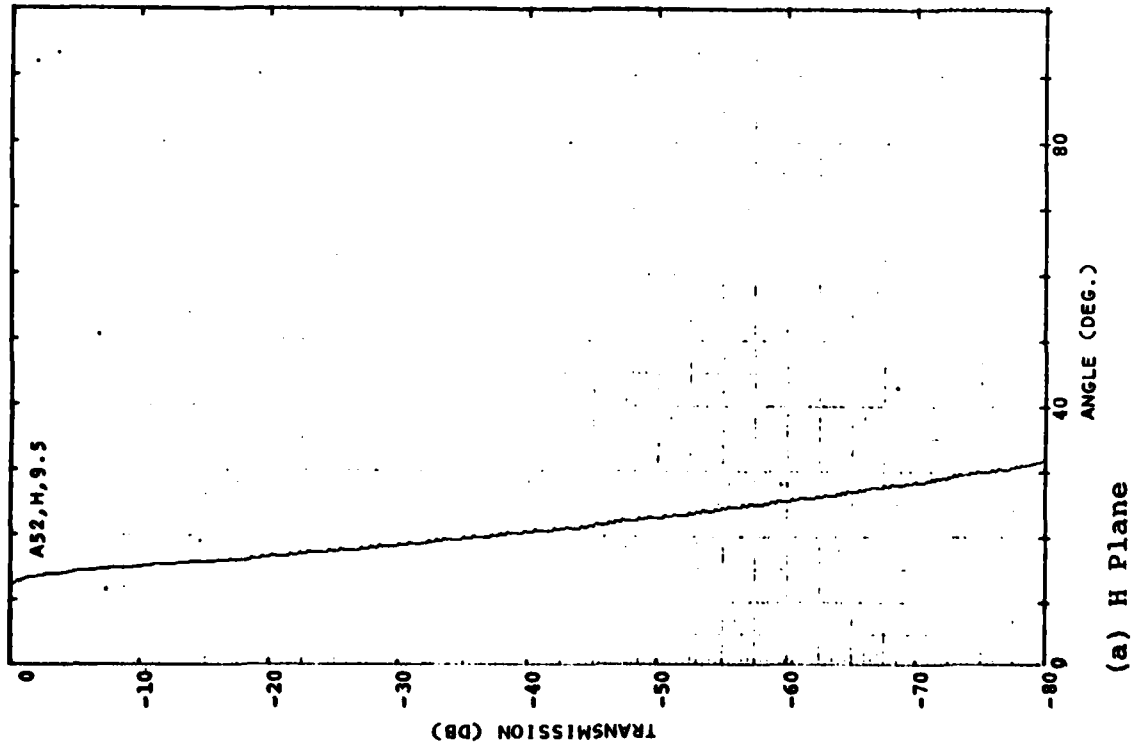


Figure A-49 Transmission, Filter A52, H and E Planes.

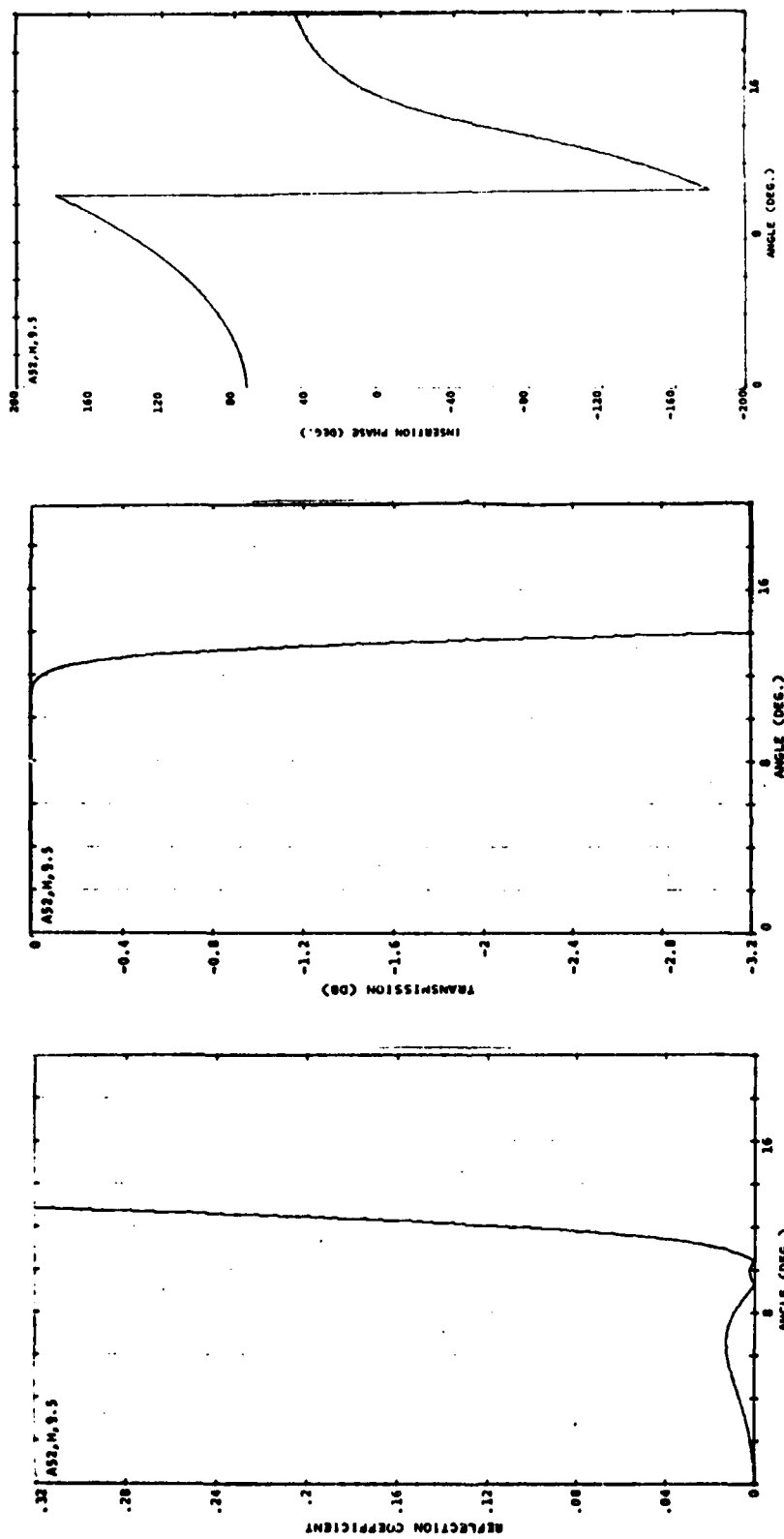


Figure A-50 Passband Reflection and Transmission, Filter A52, H Plane.

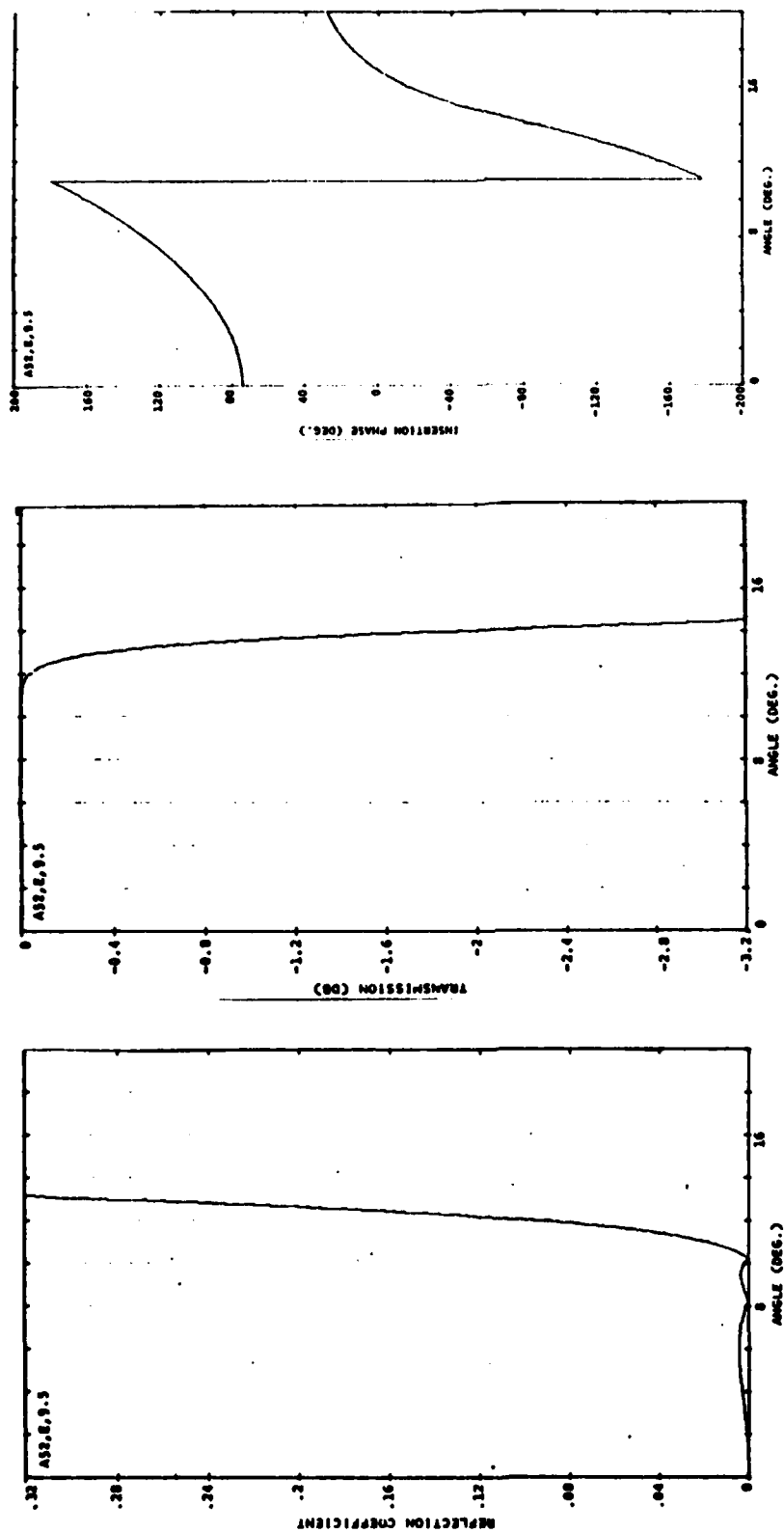


Figure A-51 Passband Reflection and Transmission, Filter A52, E Plane.

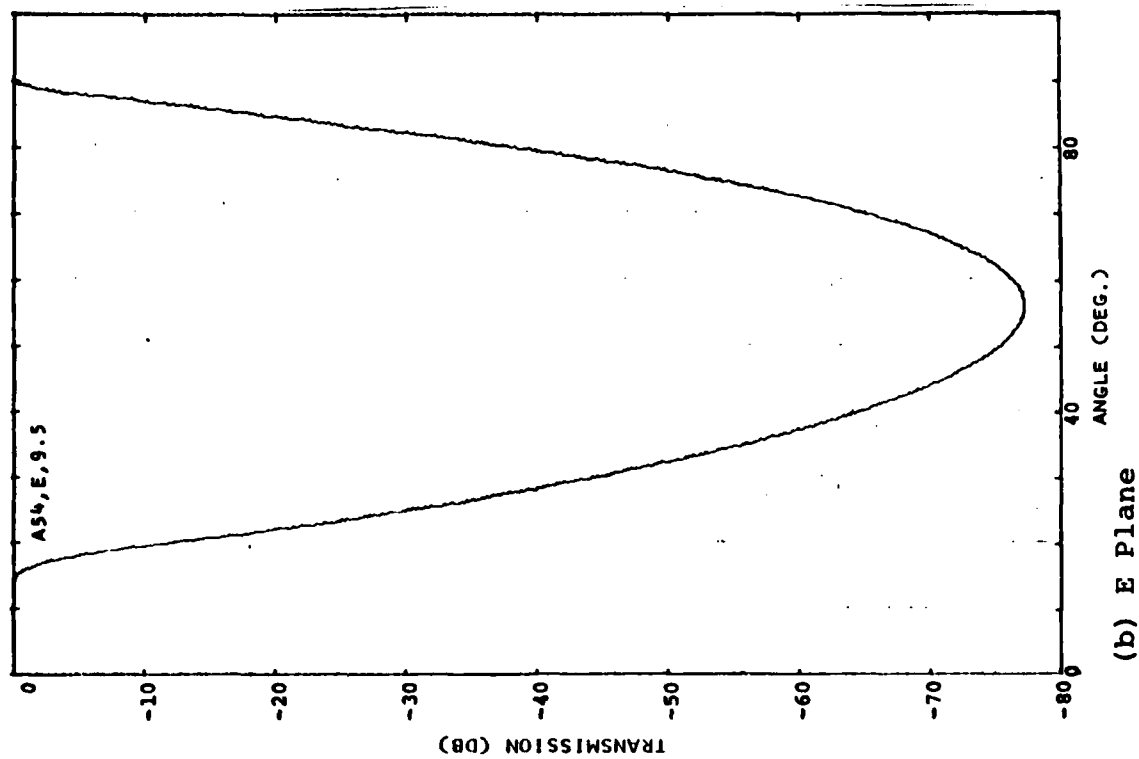
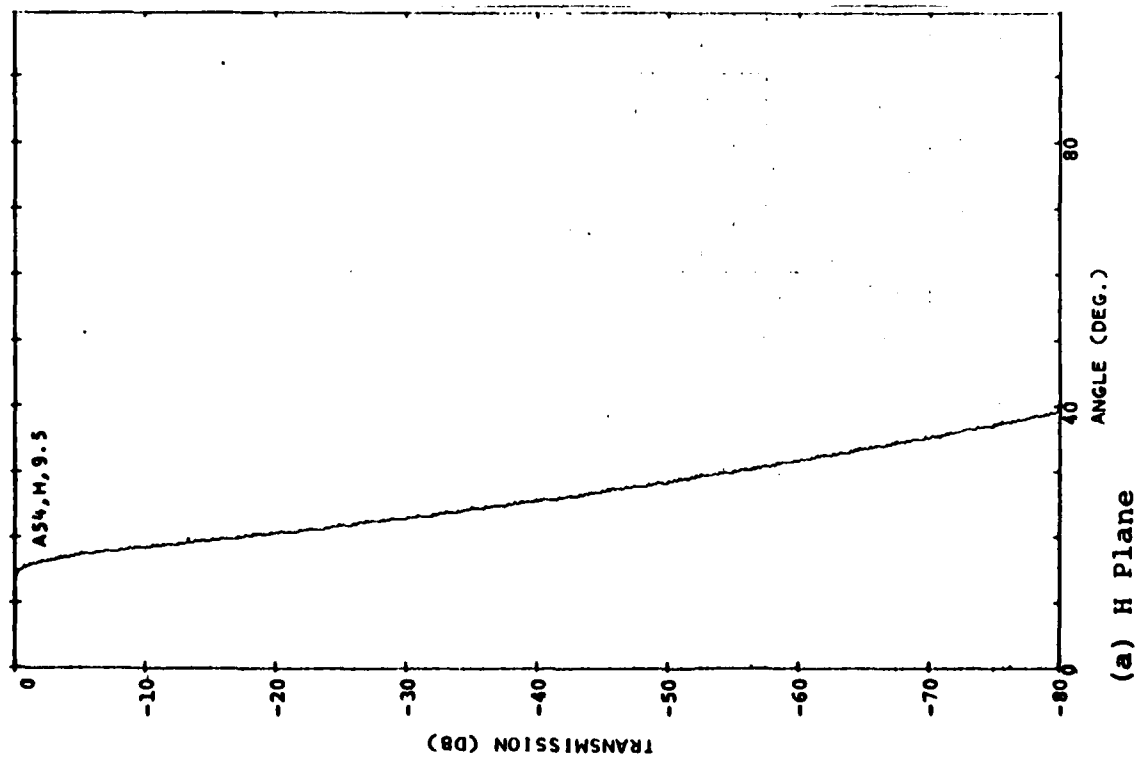


Figure A-52 Transmission, Filter A54, H and E Planes.

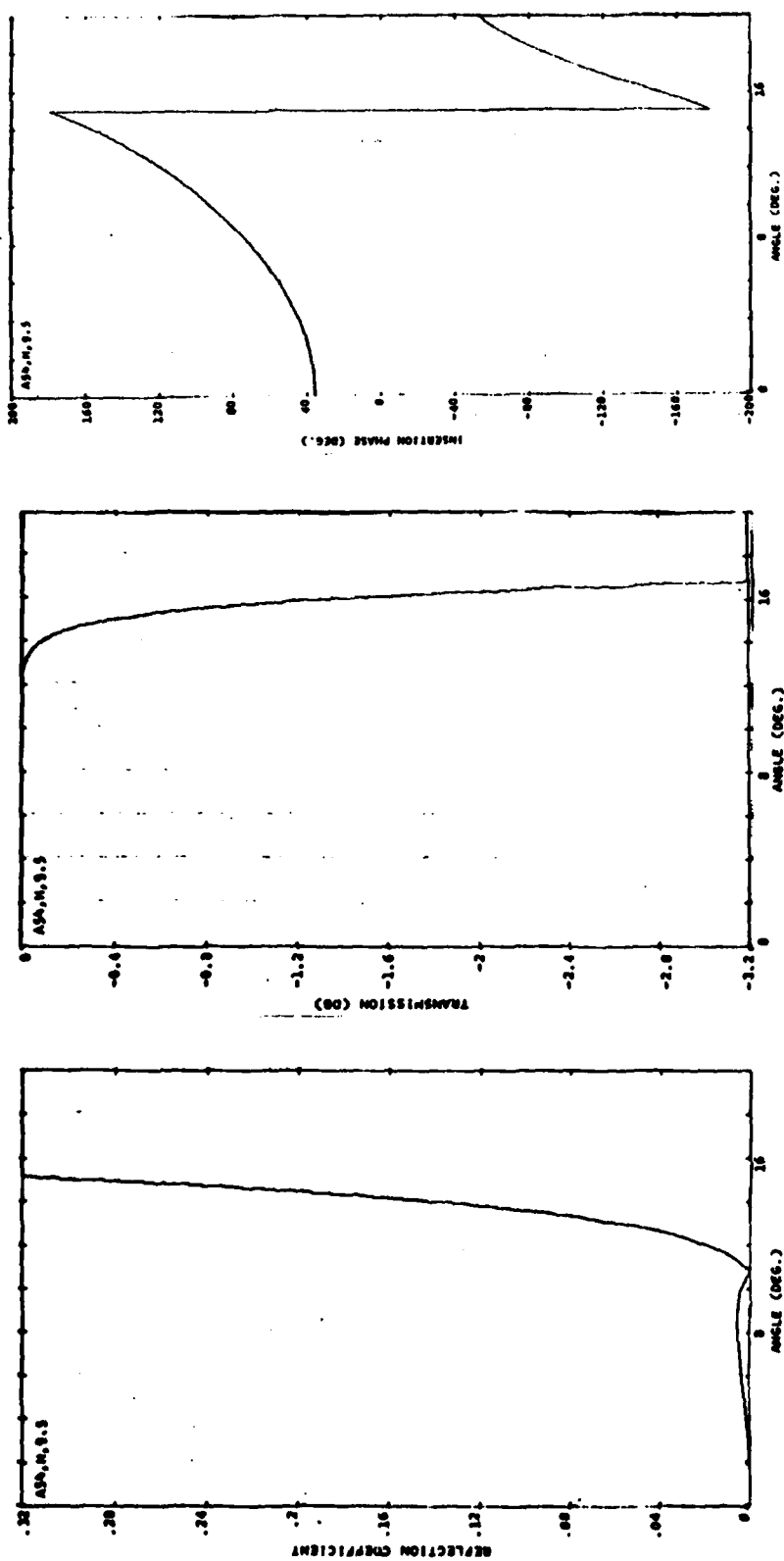


Figure A-53 Passband Reflection and Transmission, Filter A54, H Plane.

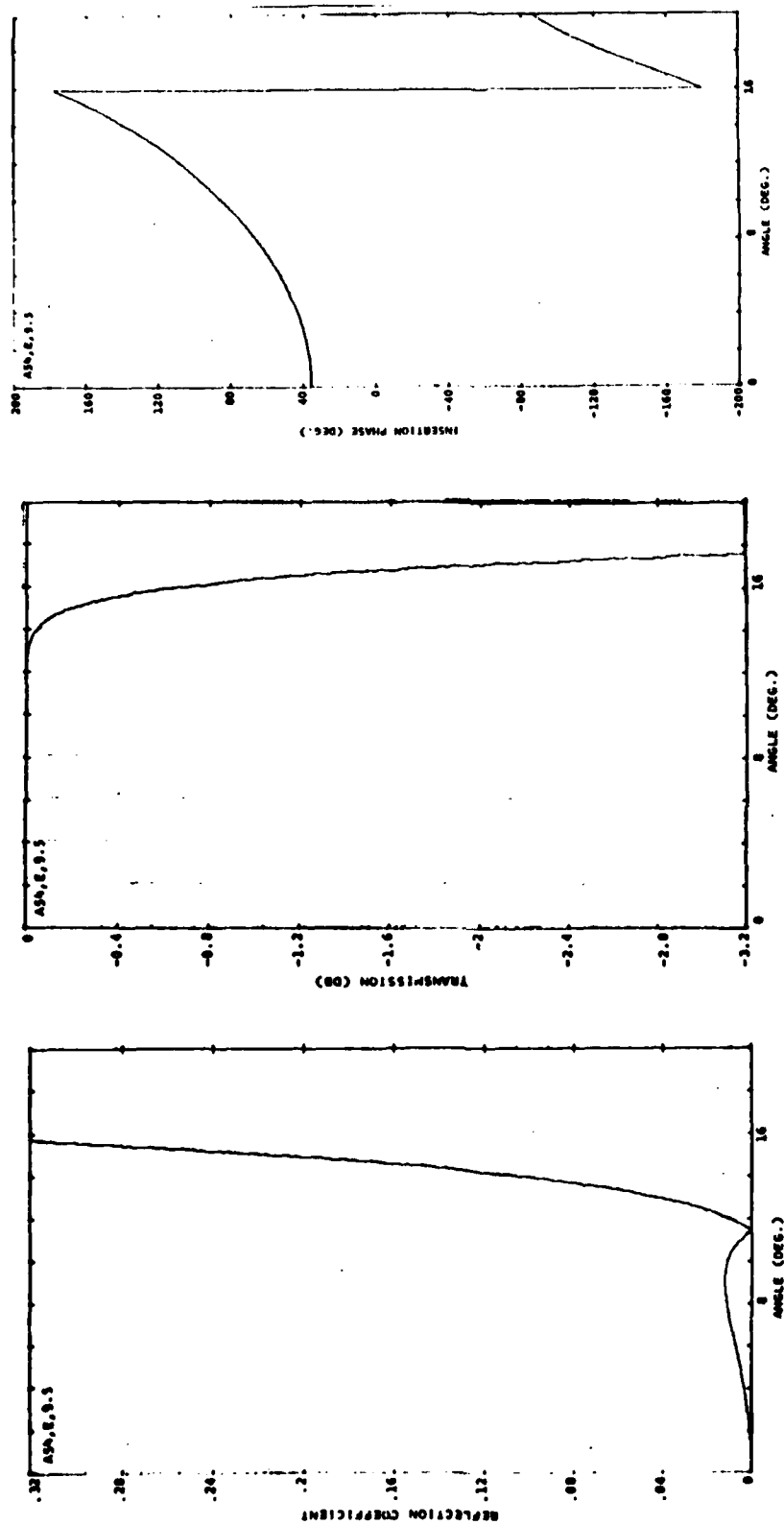
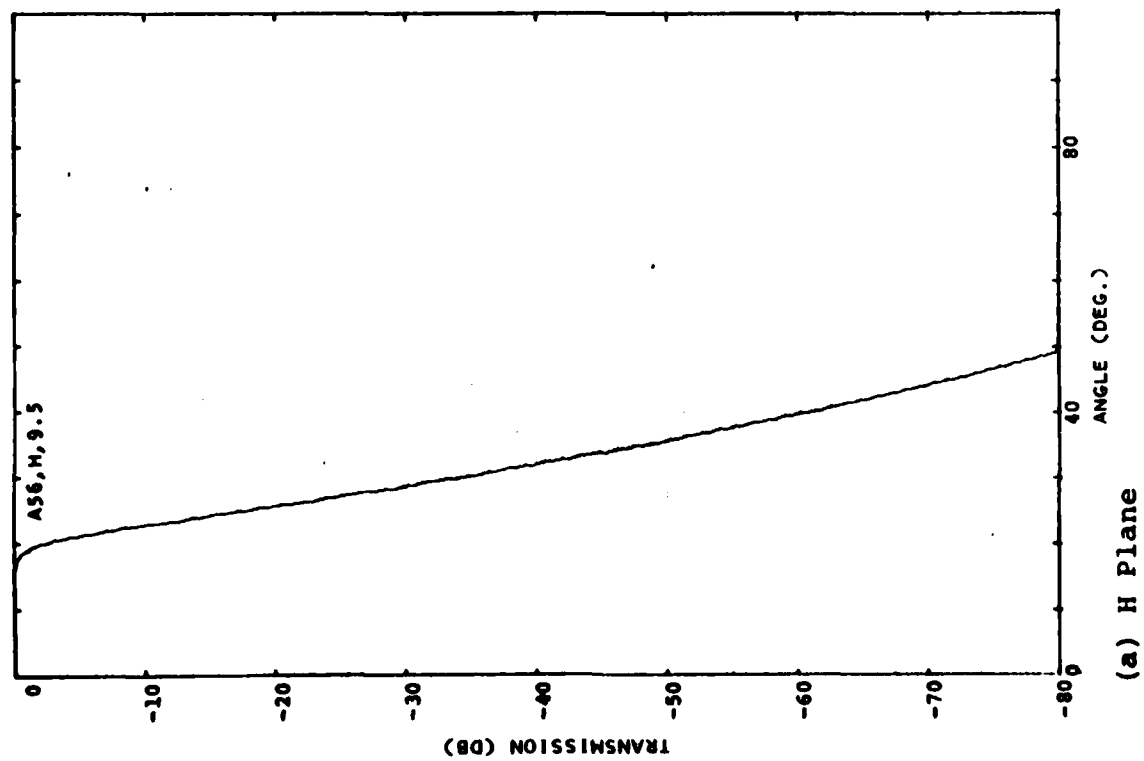
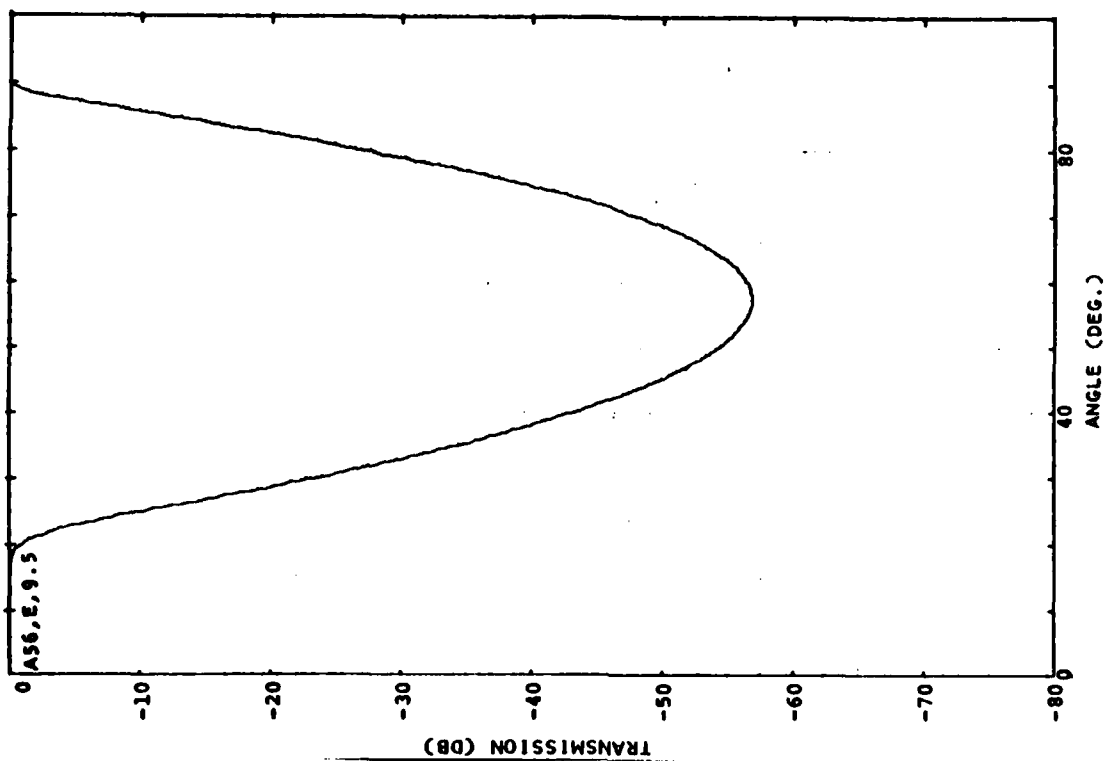


Figure A-54 Passband Reflection and Transmission, Filter A54, E Plane.



(a) H Plane



(b) E Plane

Figure A-55 Transmission, Filter A56, H and E Planes.

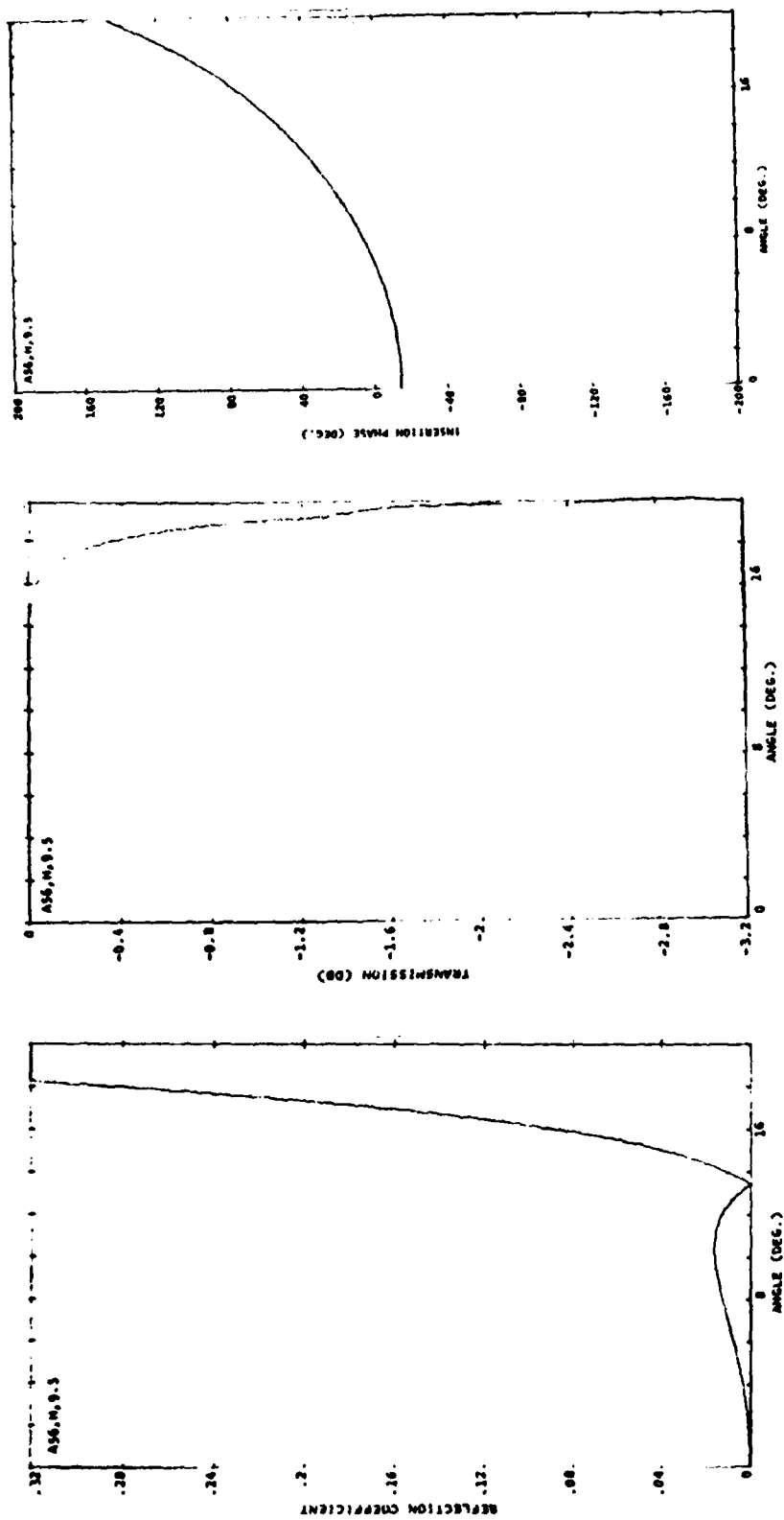


Figure A-56 Passband Reflection and Transmission, Filter A56, H Plane.

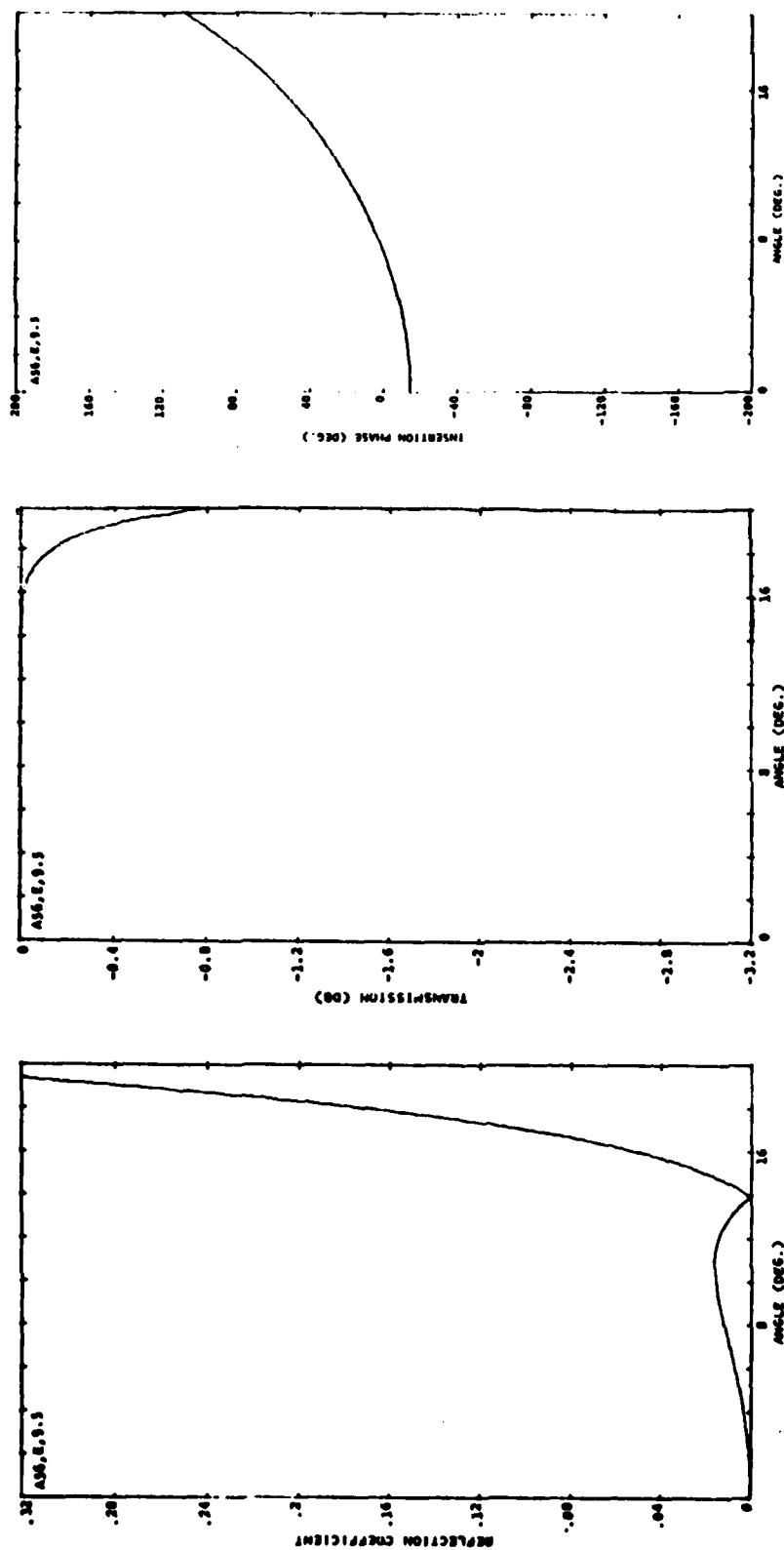
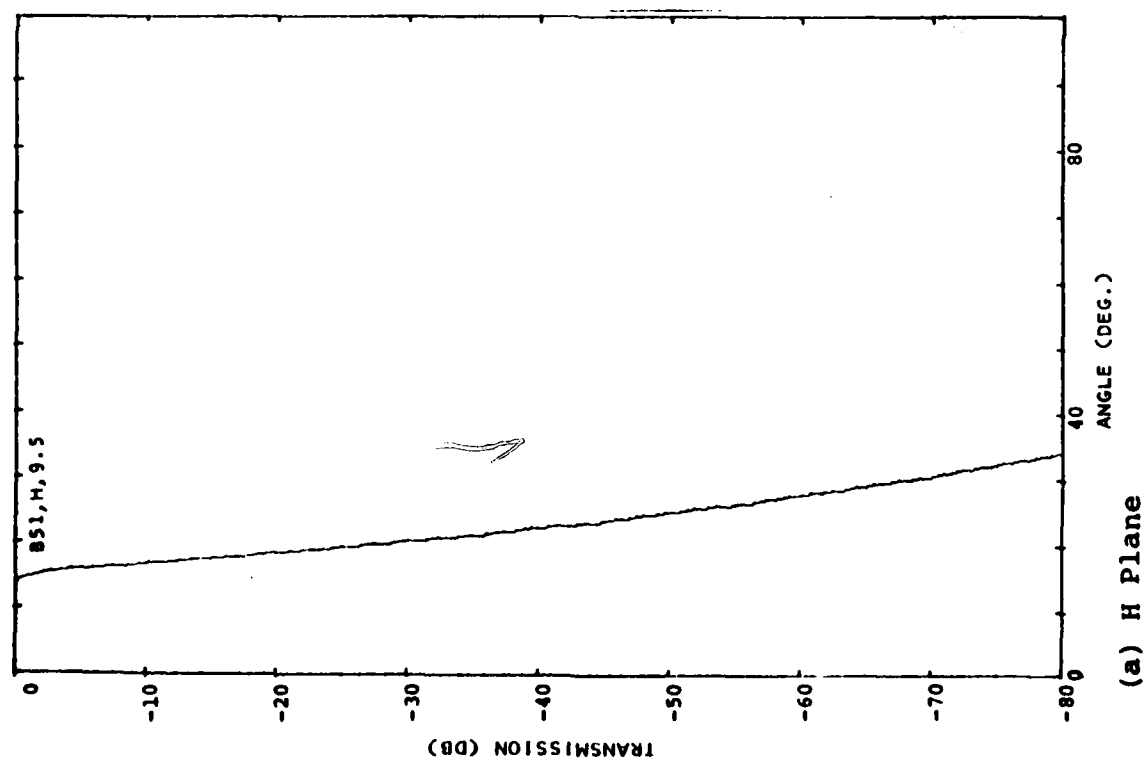
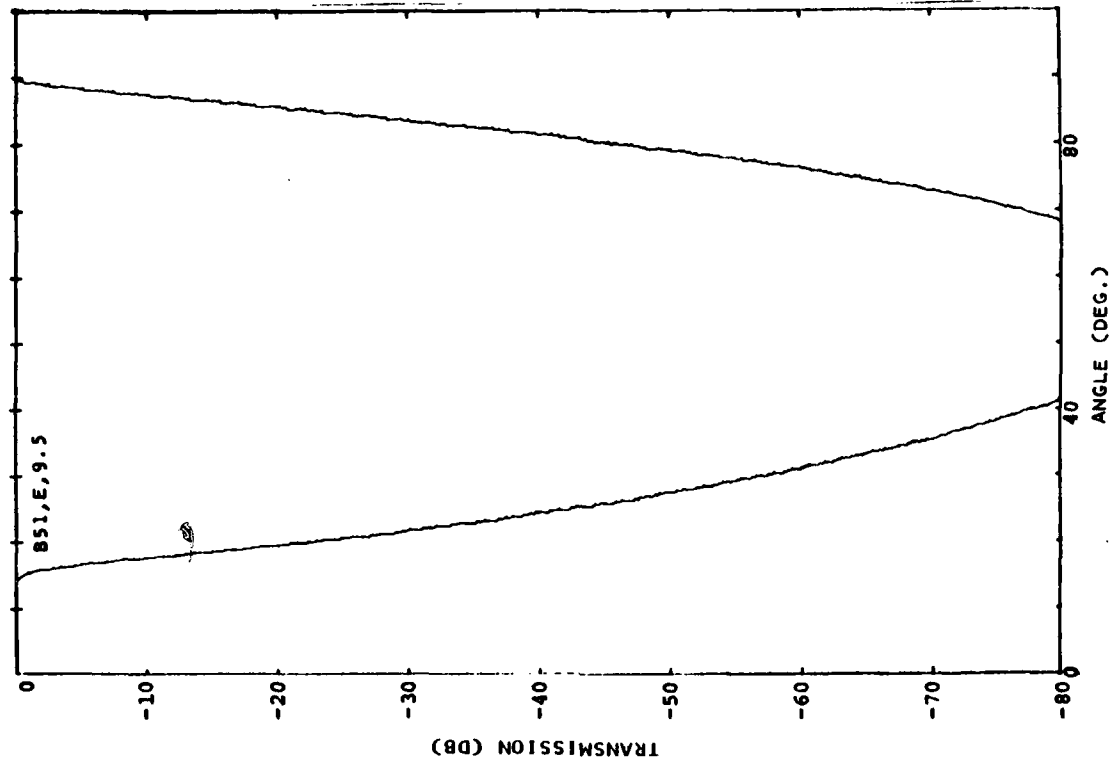


Figure A-57 Passband Reflection and Transmission, Filter A56, E Plane.



(a) H Plane



(b) E Plane

Figure A-58 Transmission, Filter B51, H and E Planes.

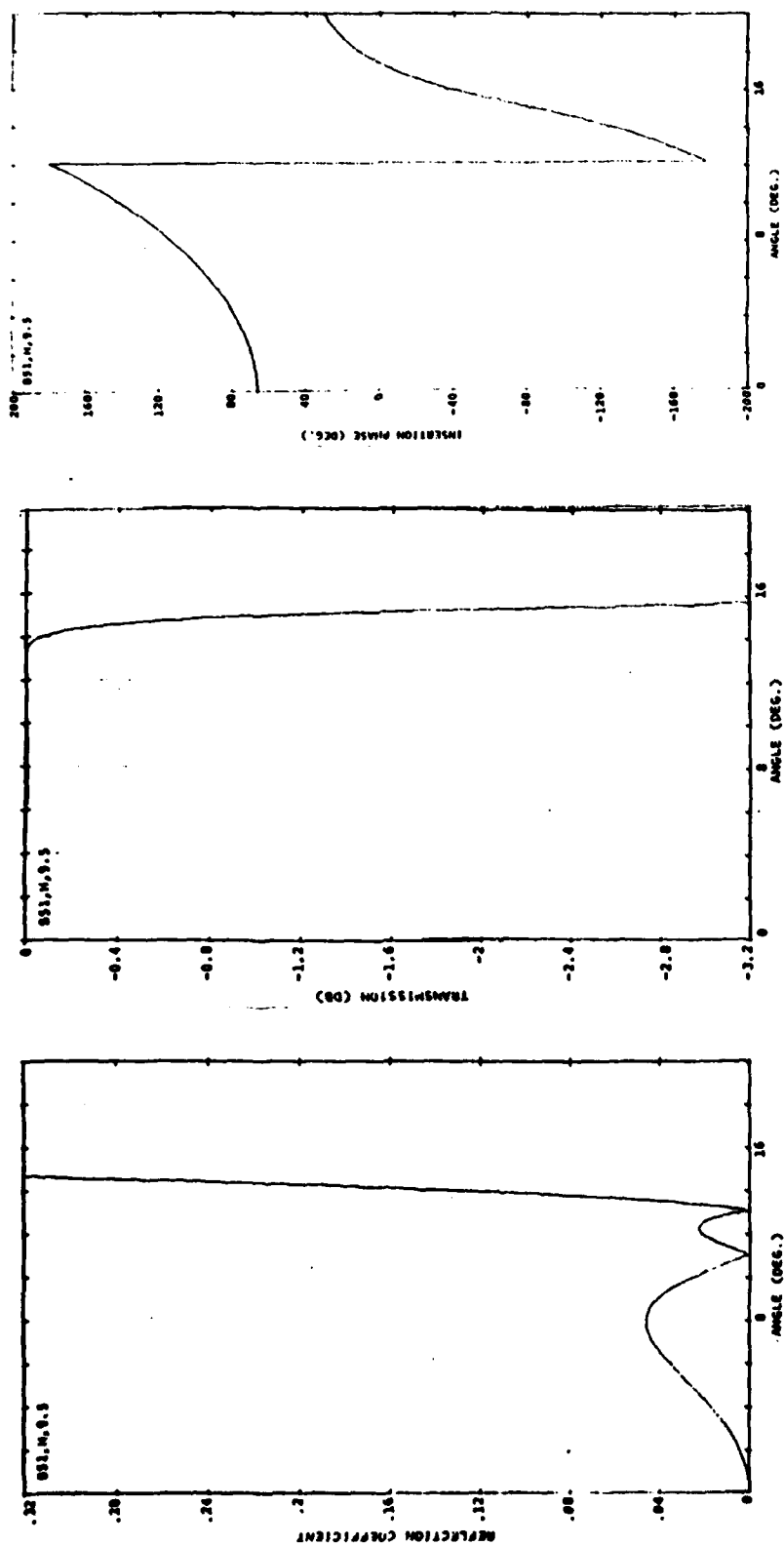


Figure A-59 Passband Reflection and Transmission, Filter B51, H Plane.

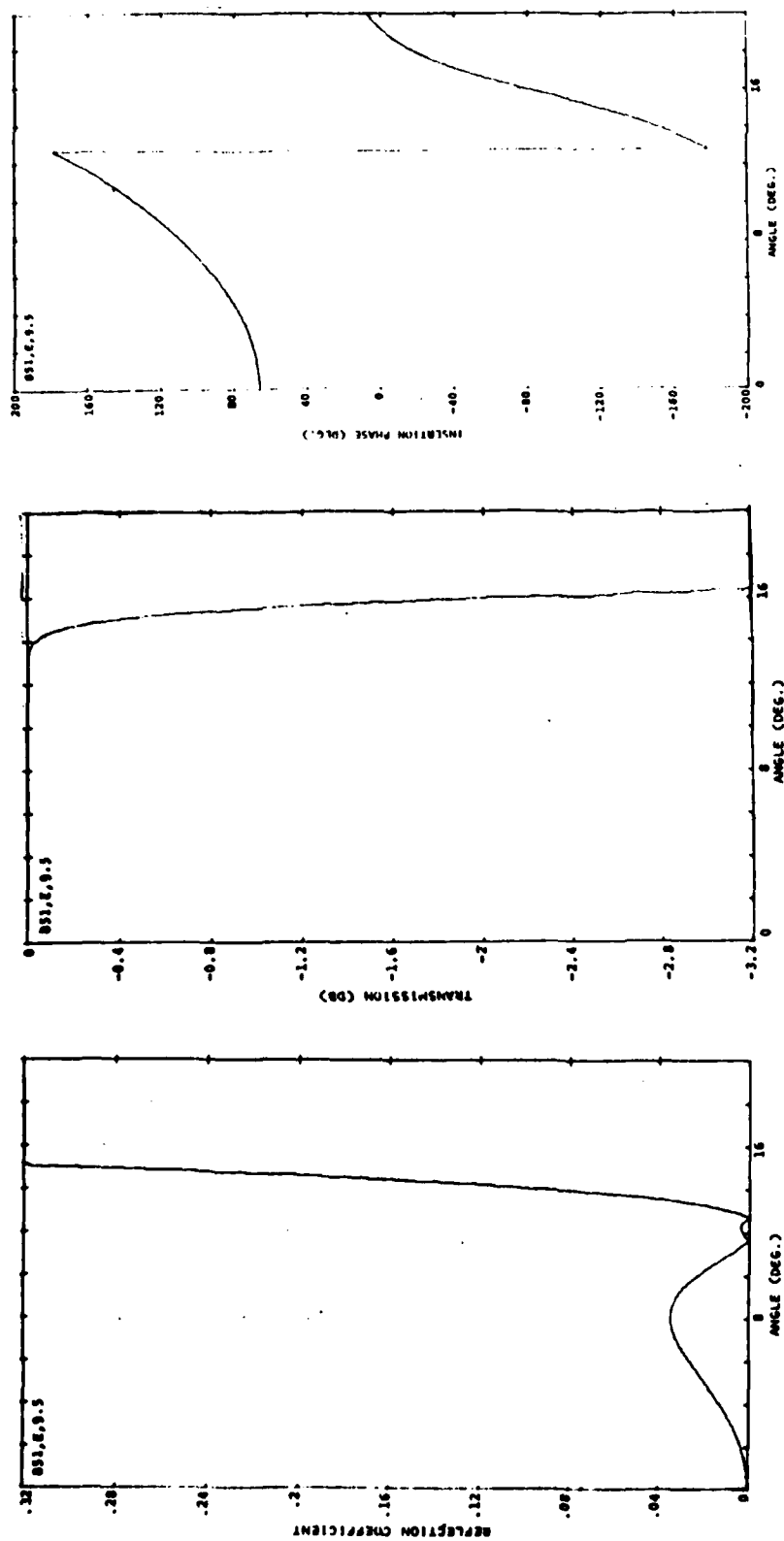
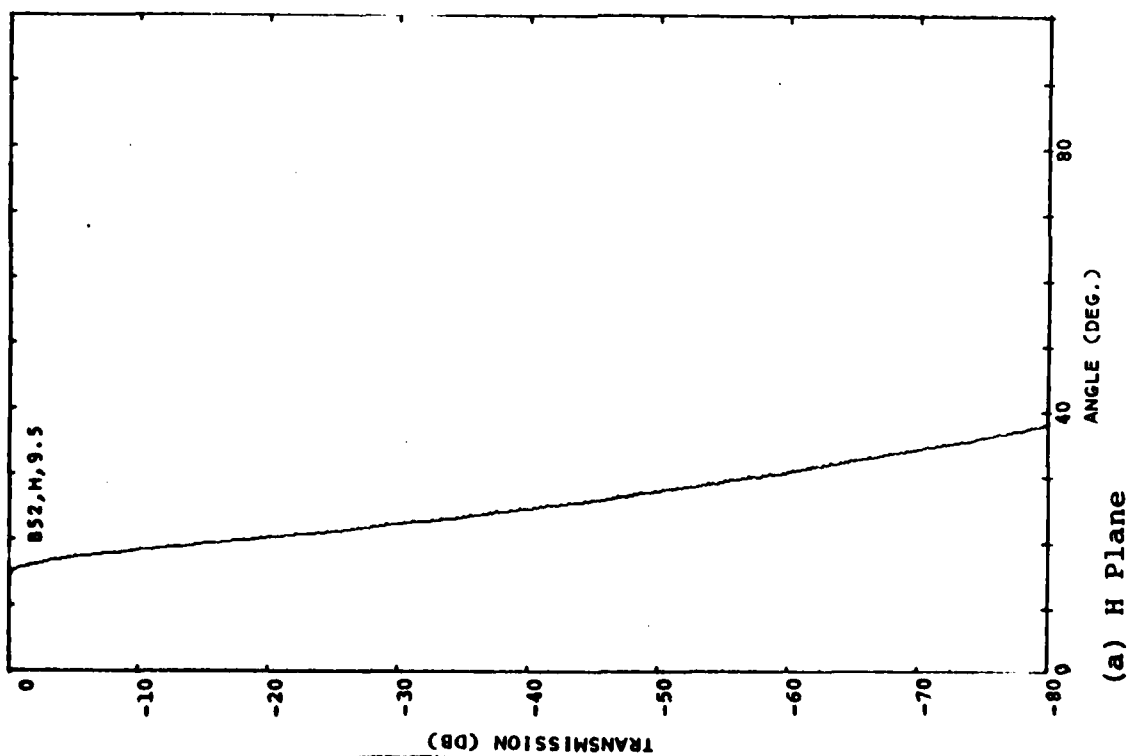
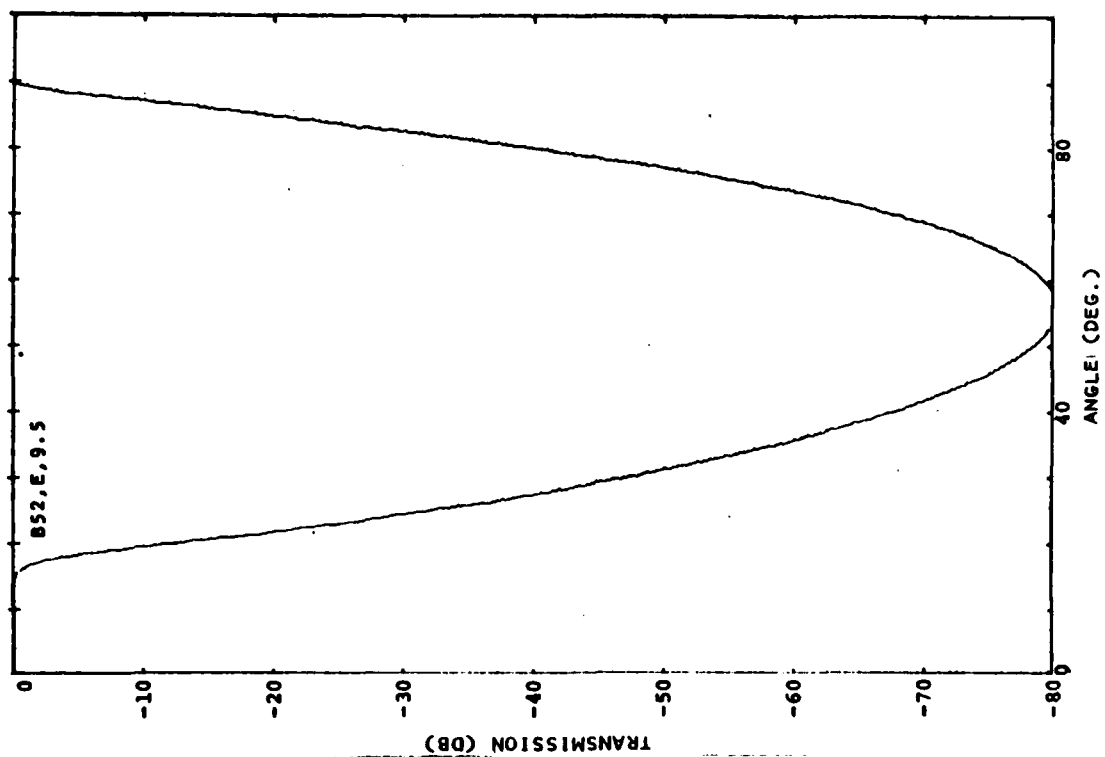


Figure A-60 Passband Reflection and Transmission, Filter B51, E Plane.



(a) H Plane



(b) E Plane

Figure A-61 Transmission, Filter B52, H and E Planes.

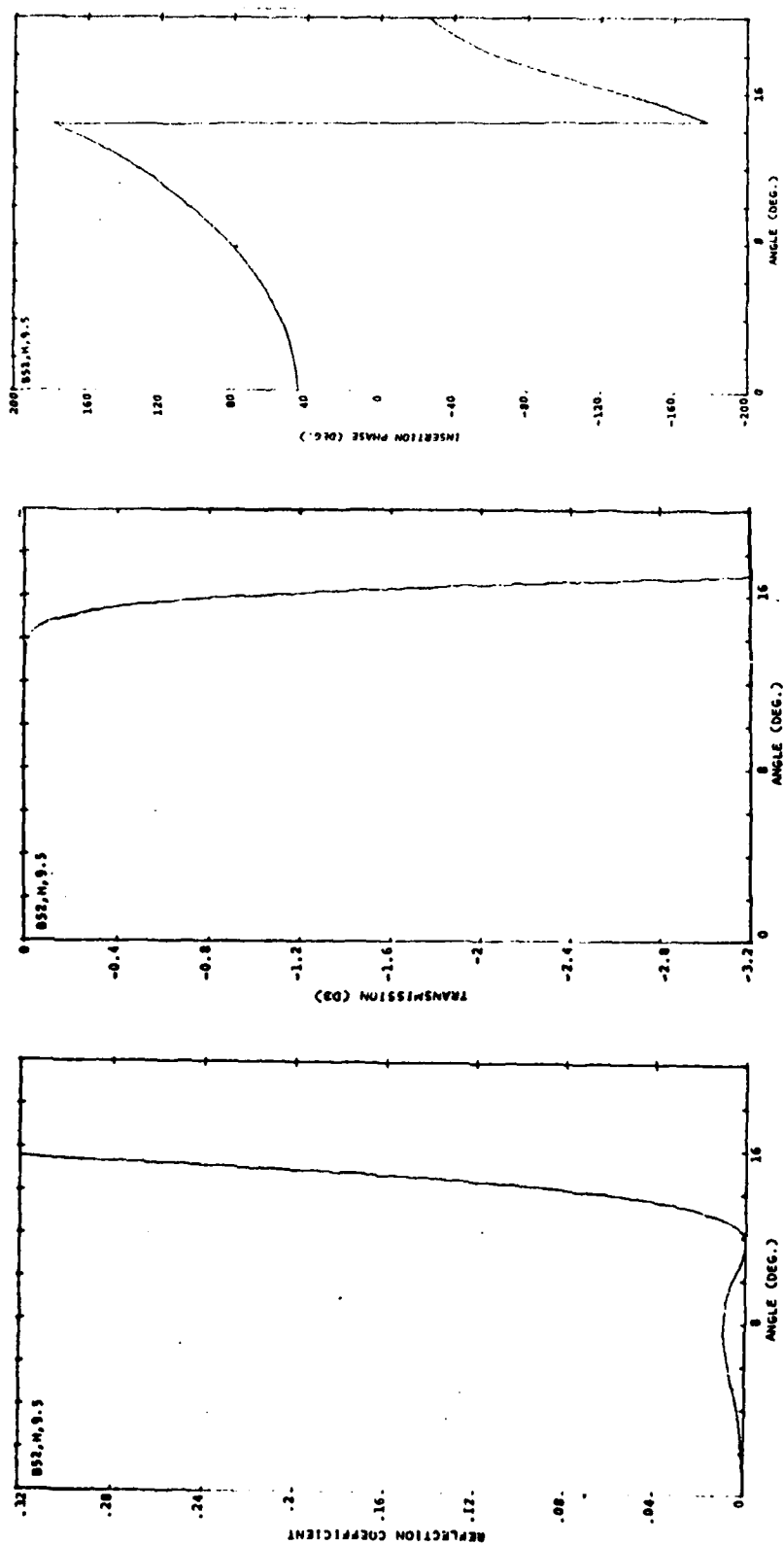


Figure A-62 Passband Reflection and Transmission, Filter B52, H Plane.

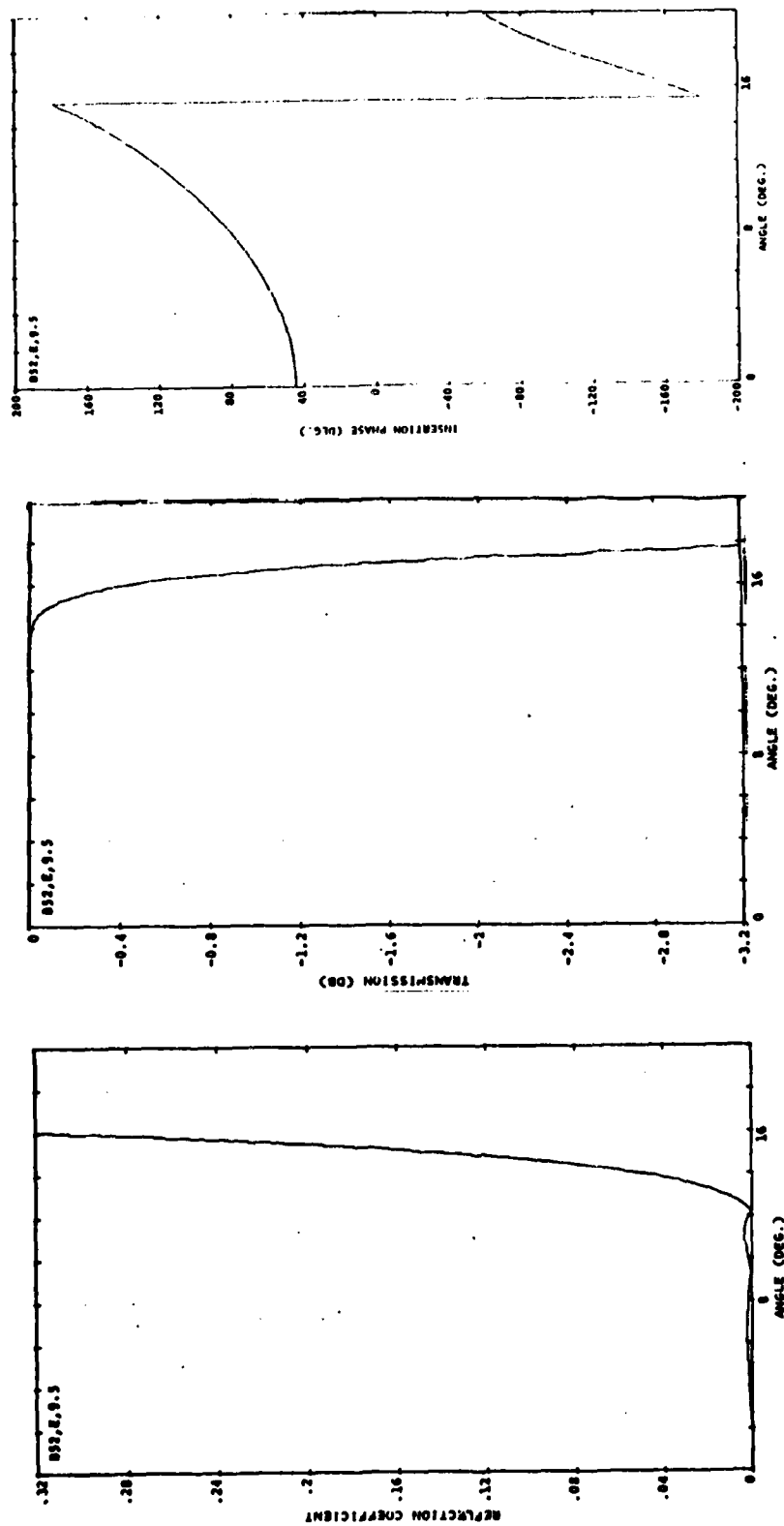


Figure A-63 Passband Reflection and Transmission, Filter B52, E Plane.

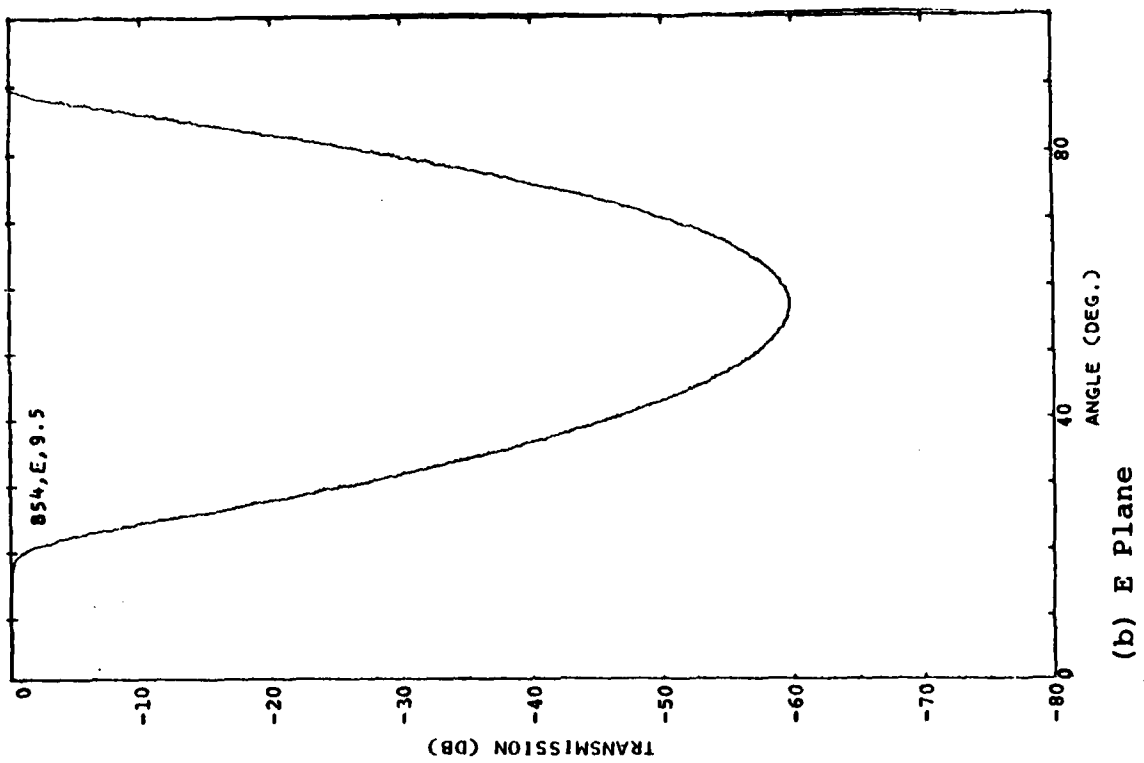
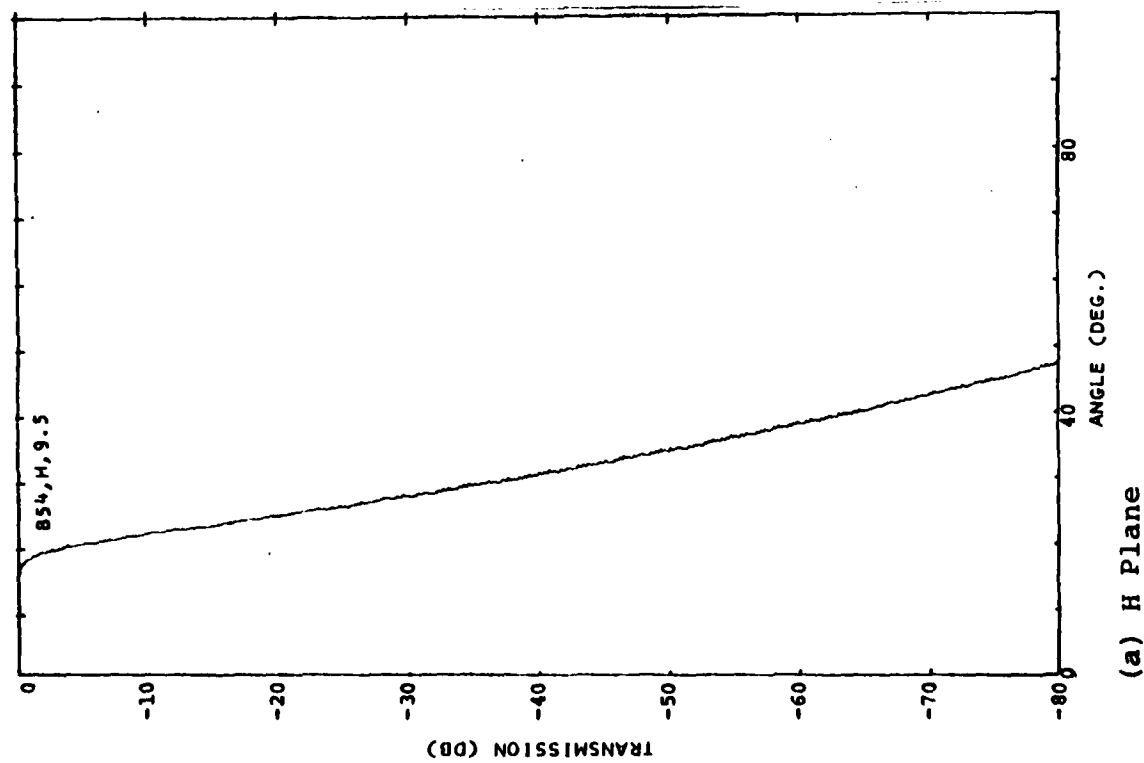


Figure A-64 Transmission, Filter B54, H and E Planes.

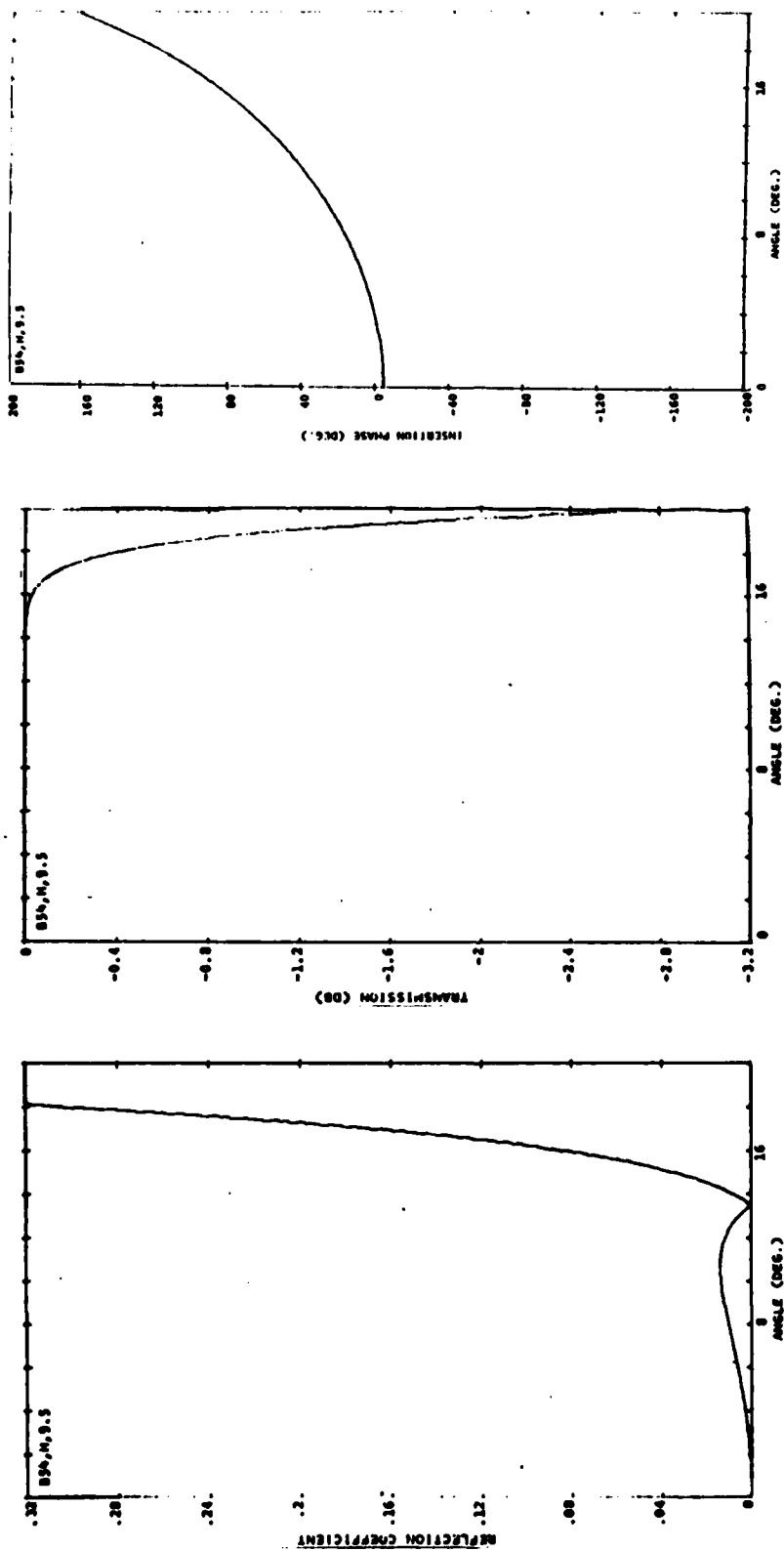


Figure A-65 Passband Reflection and Transmission, Filter B54, H Plane.

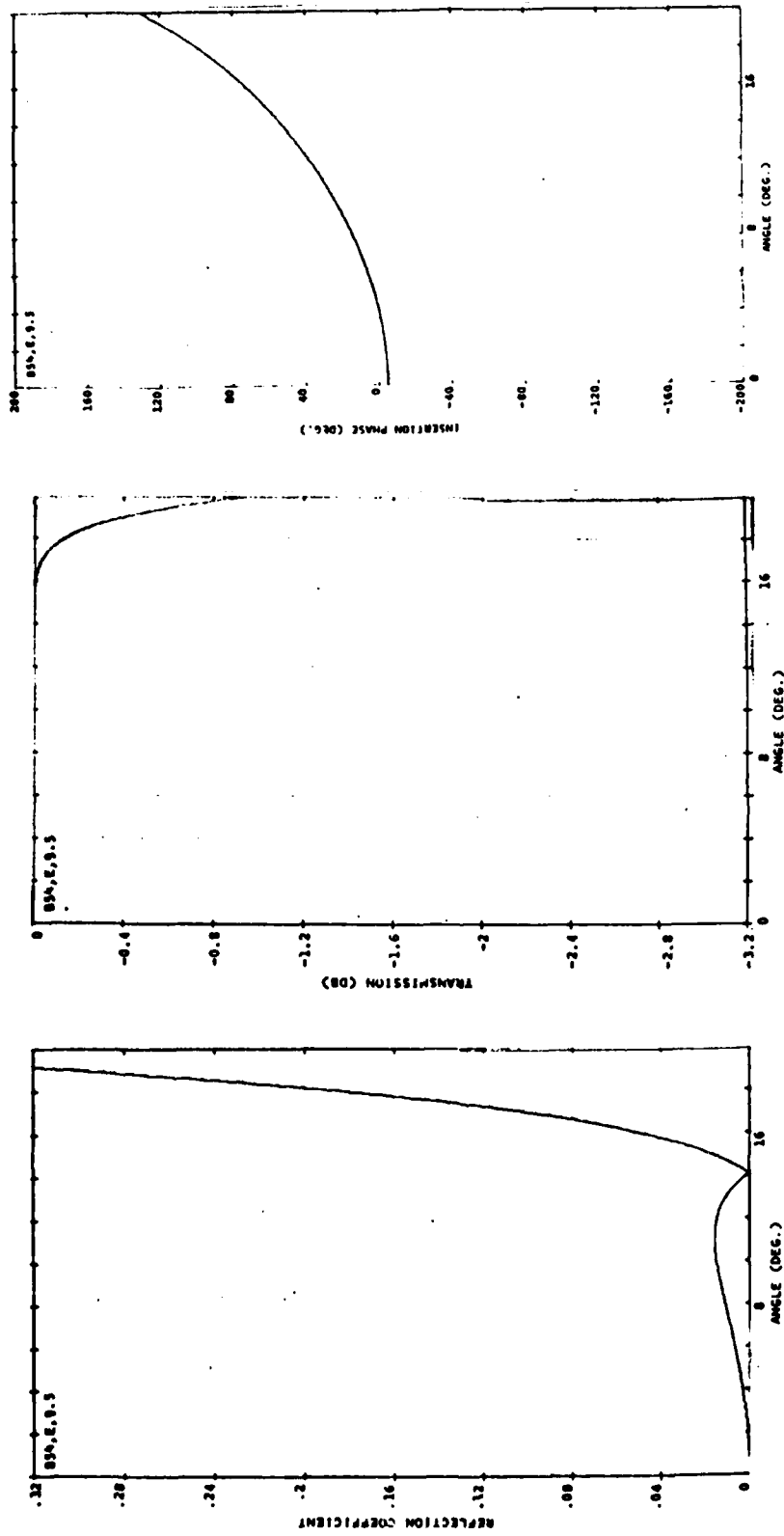


Figure A-66 Passband Reflection and Transmission, Filter B54, E Plane.

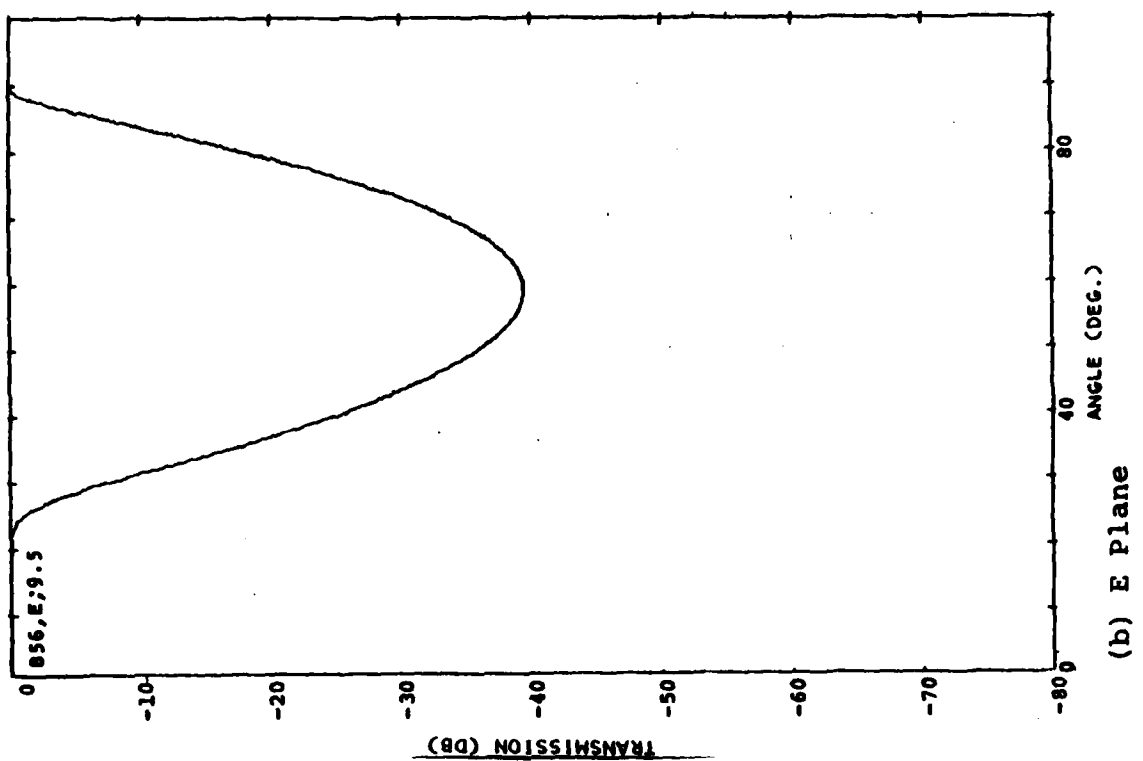
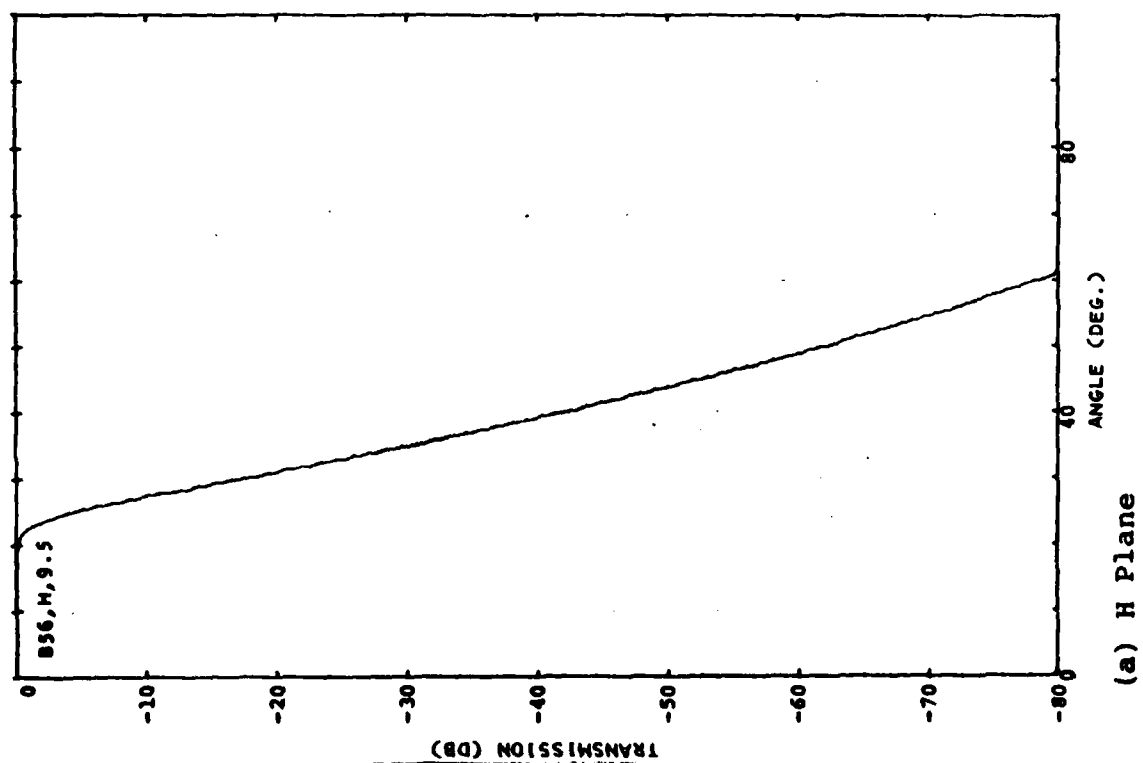


Figure A-67 Transmission, Filter B56, H and E Planes.

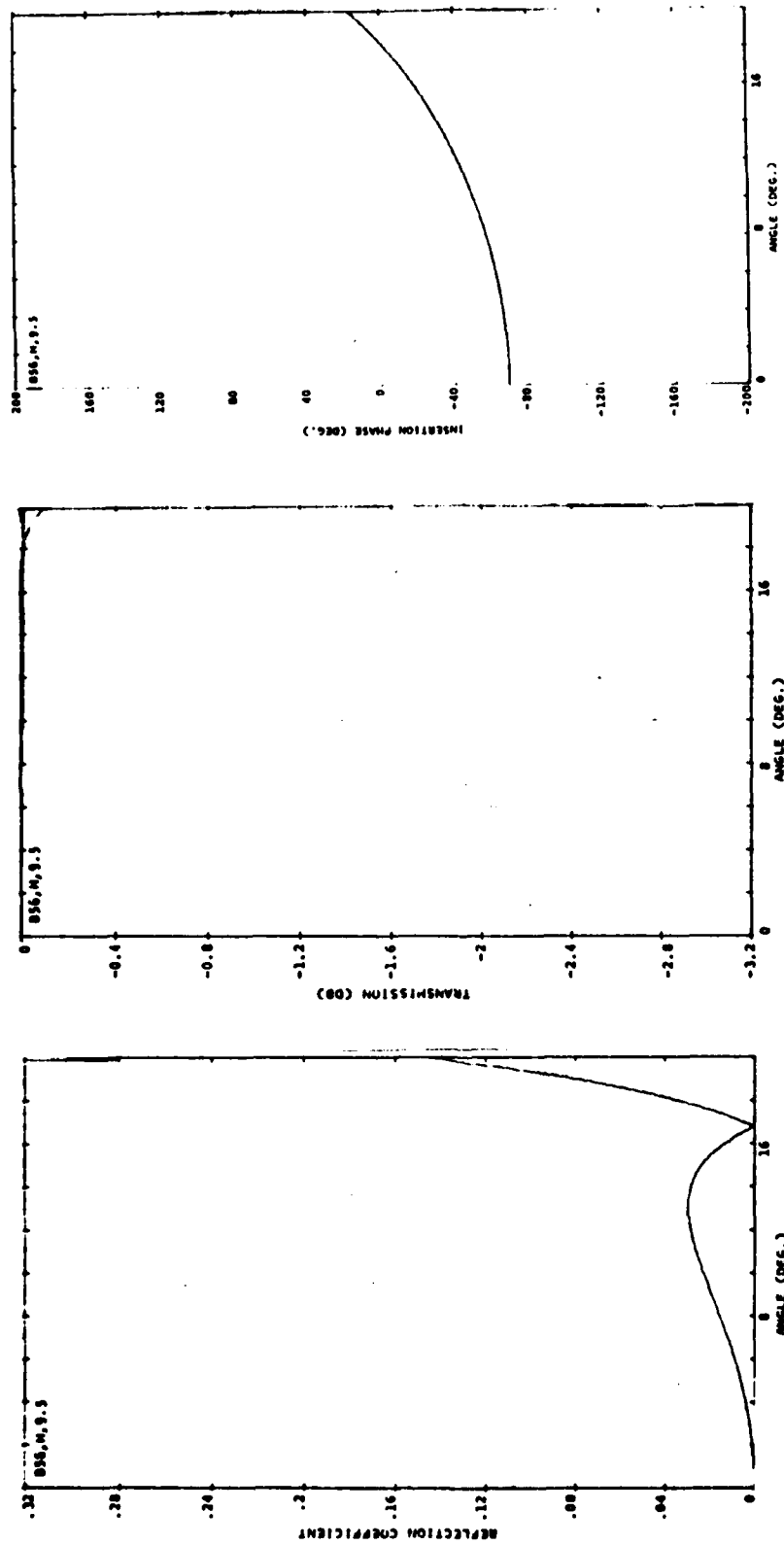


Figure A-68 Passband Reflection and Transmission, Filter B56, H Plane.

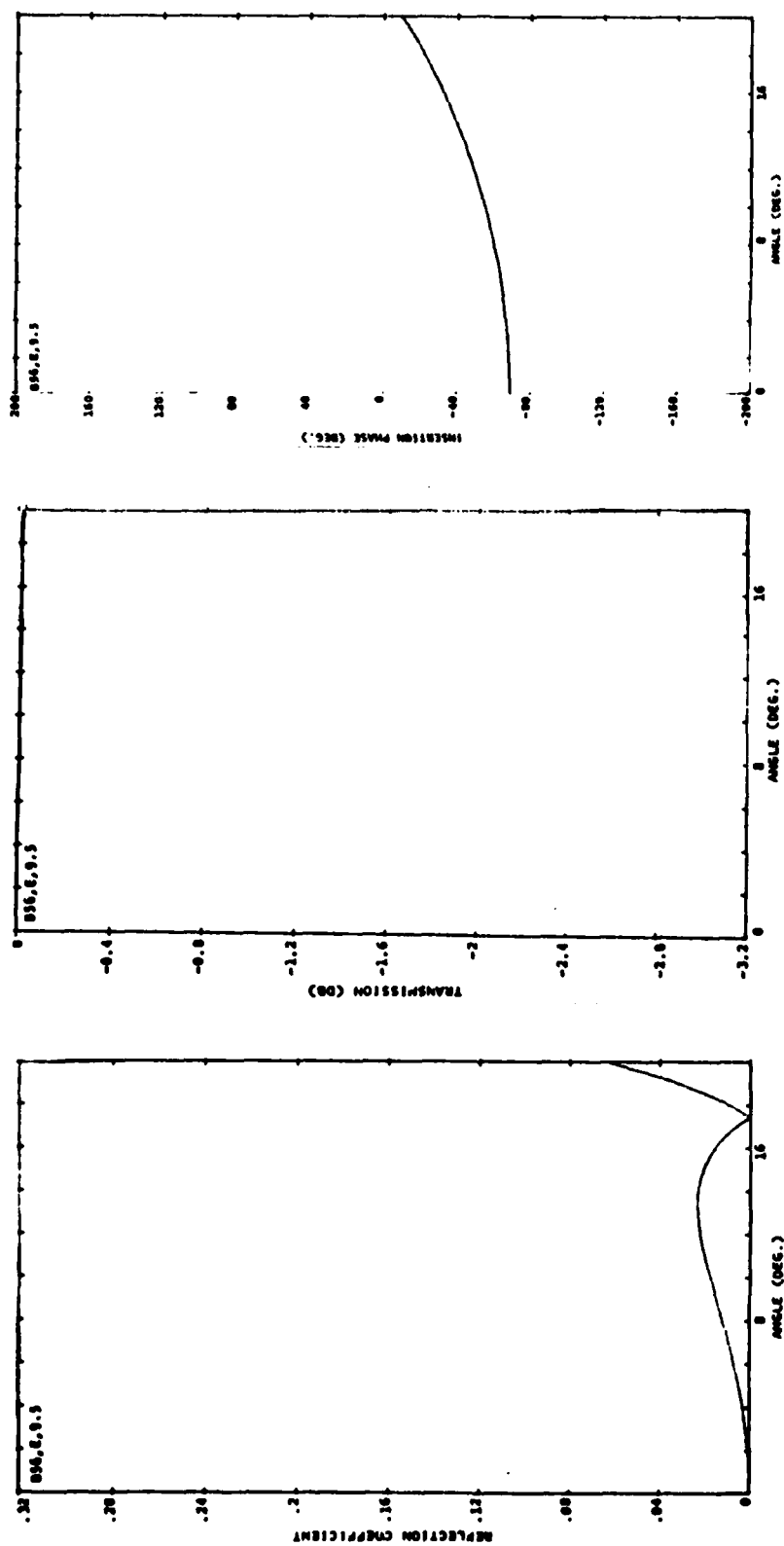


Figure A-69 Passband Reflection and Transmission, Filter B56, E Plane.

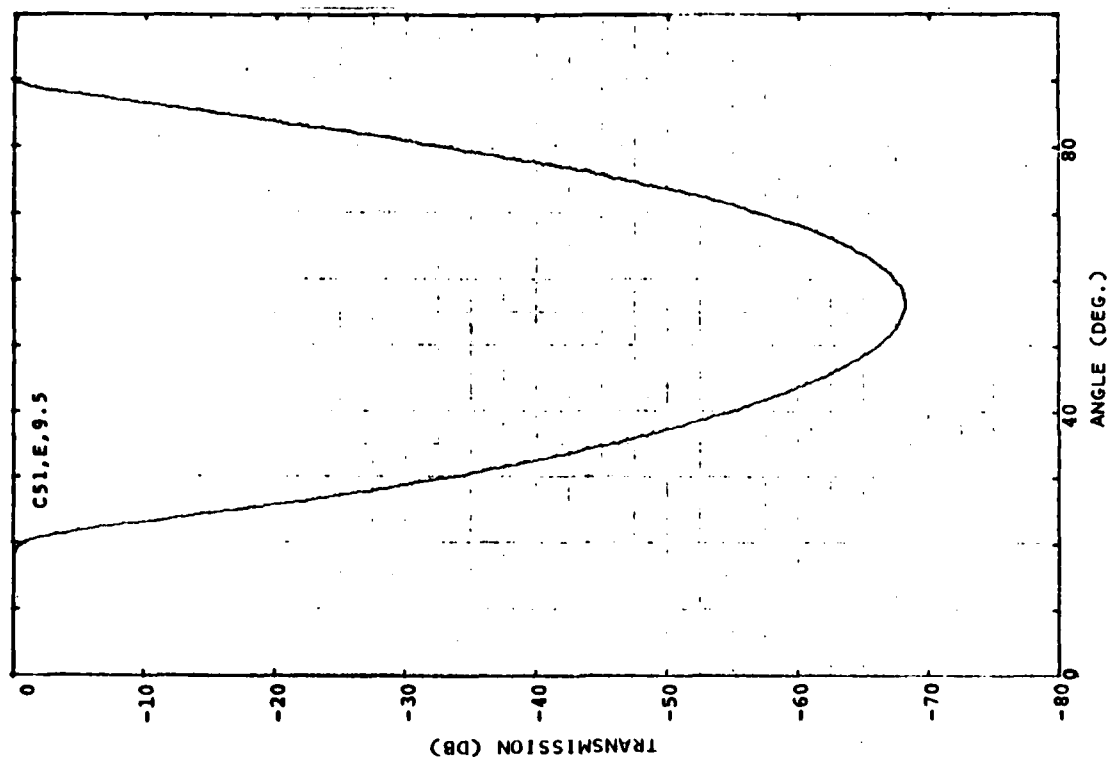
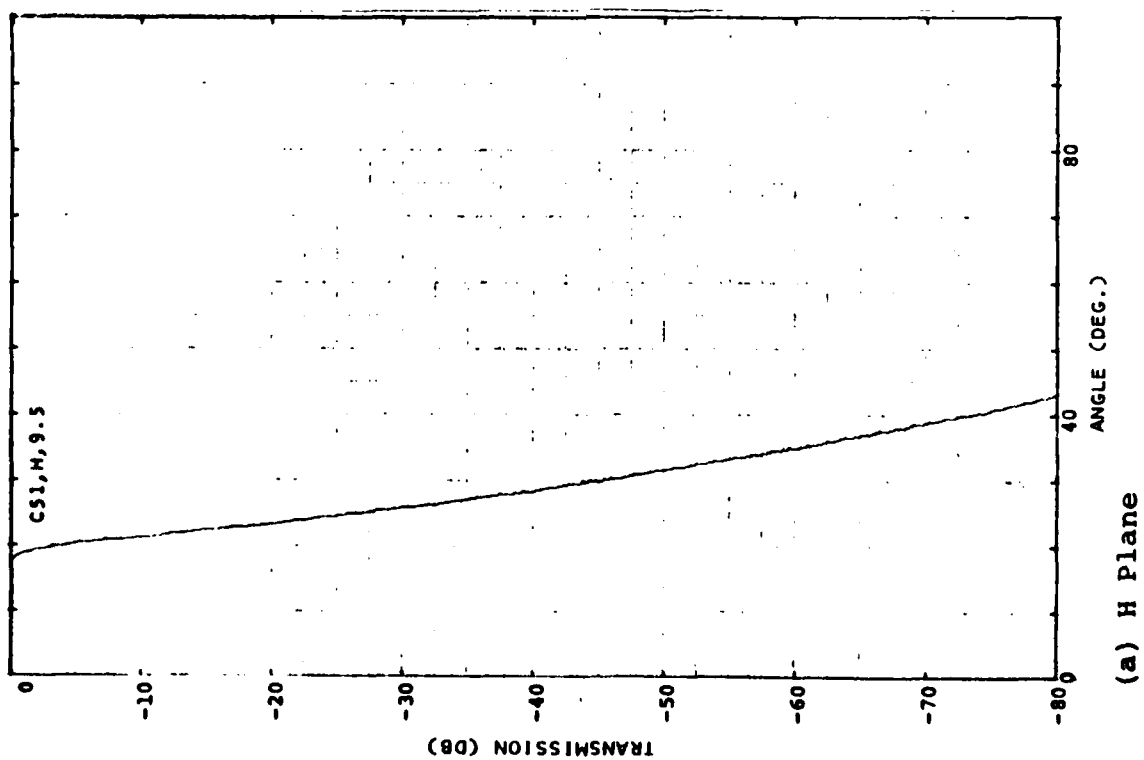


Figure A-70 Transmission, Filter CS1, H and E Planes.

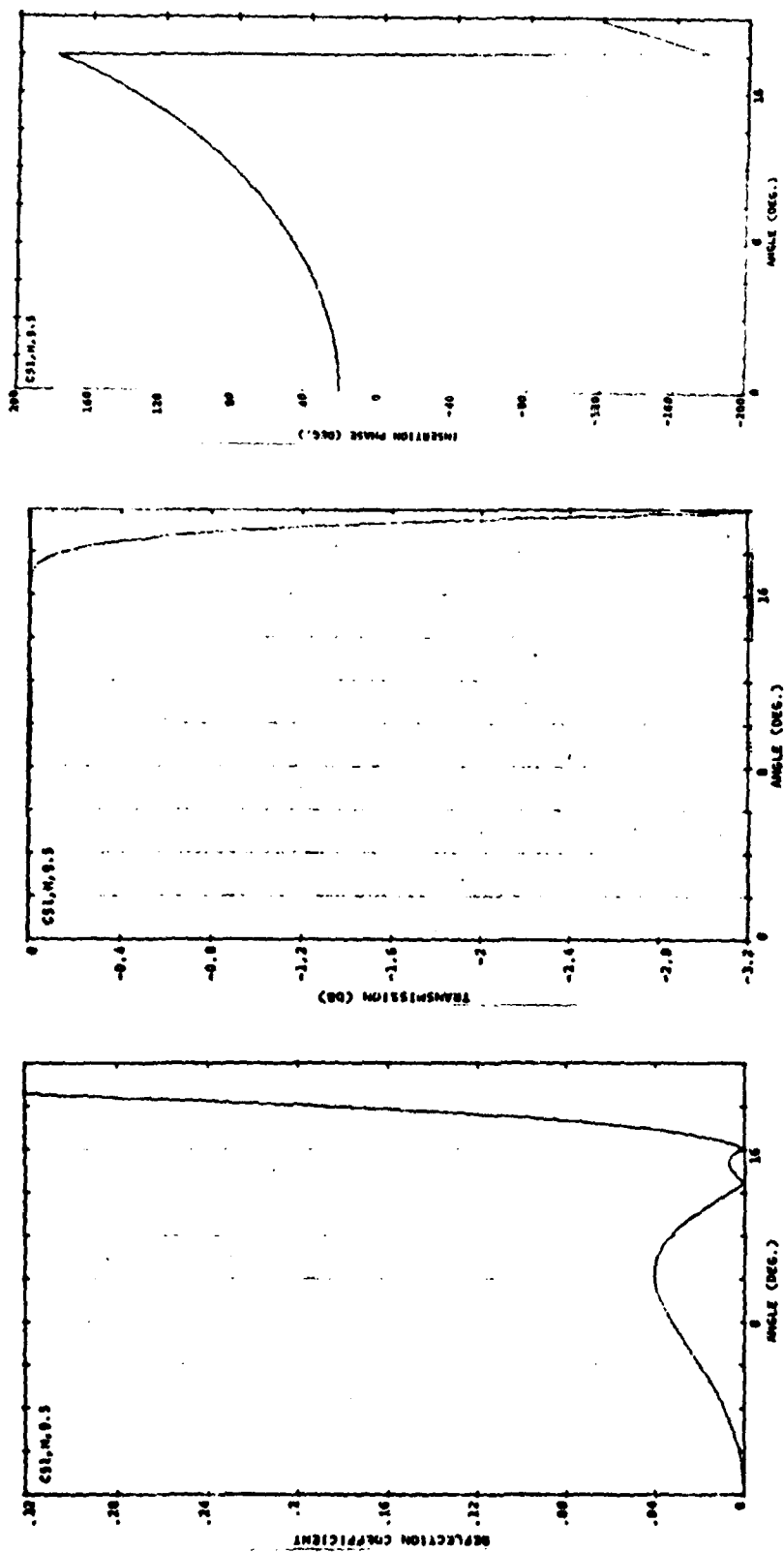


Figure A-71 Passband Reflection and Transmission, Filter C51, H Plane.

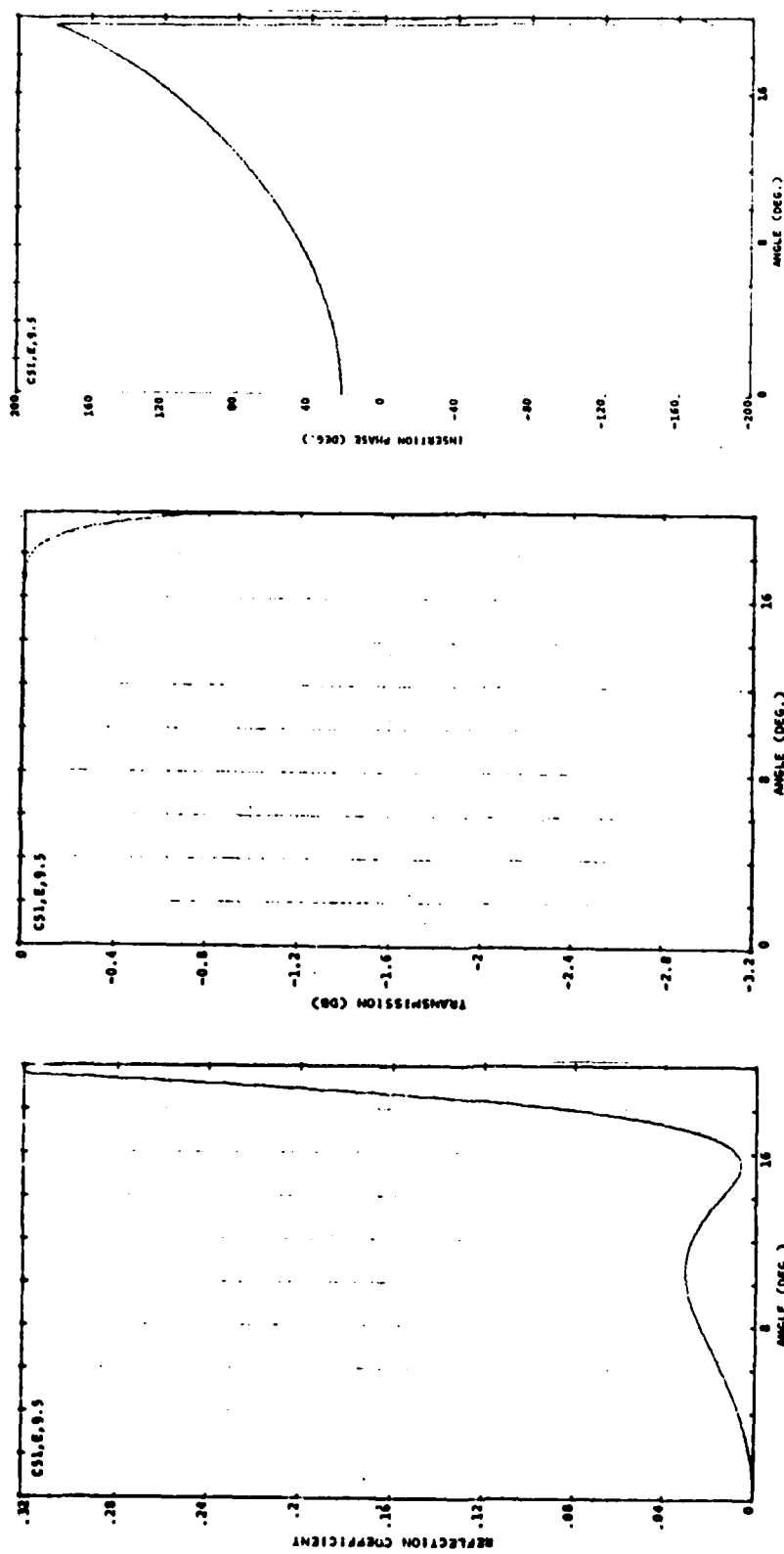
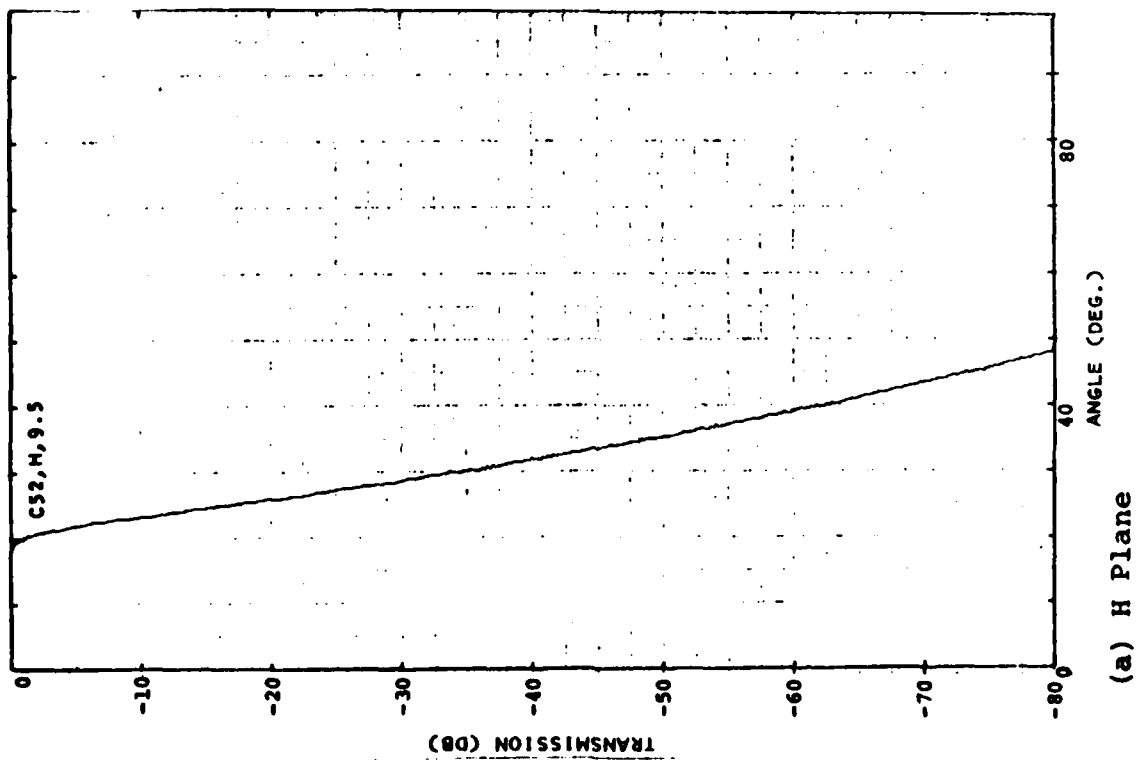
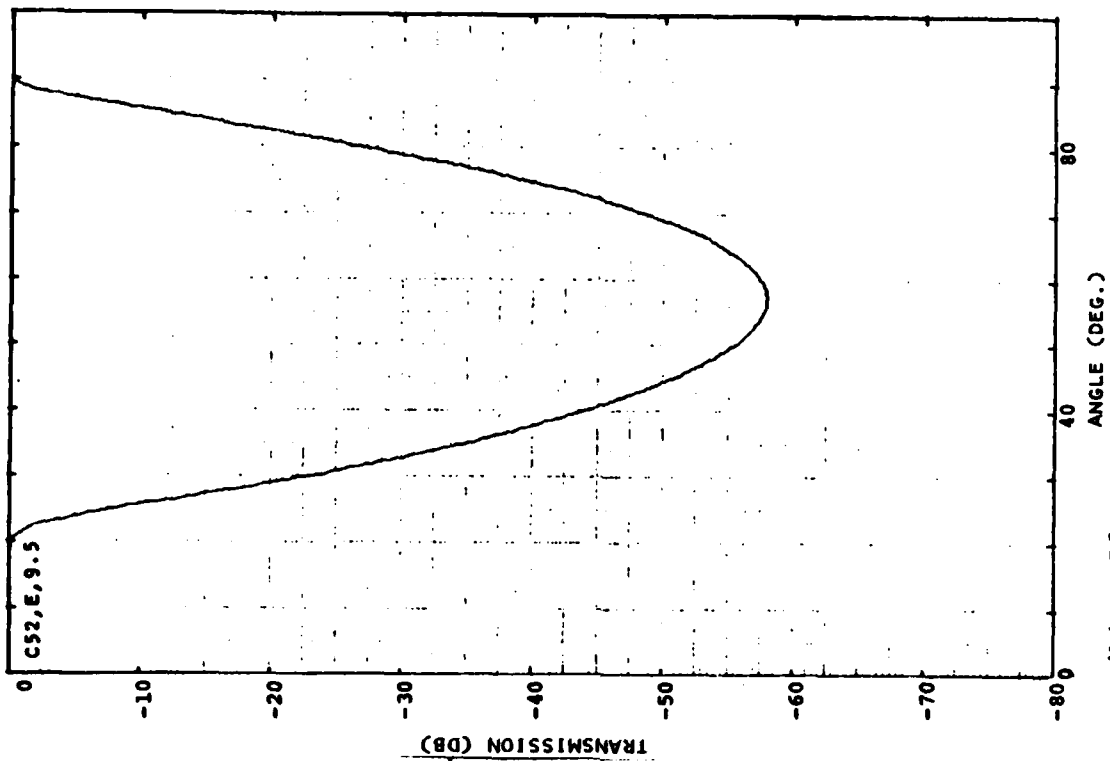


Figure A-72 Passband Reflection and Transmission, Filter C51, E Plane.



(a) H Plane



(b) E Plane

Figure A-73 Transmission, Filter C52, H and E Planes.

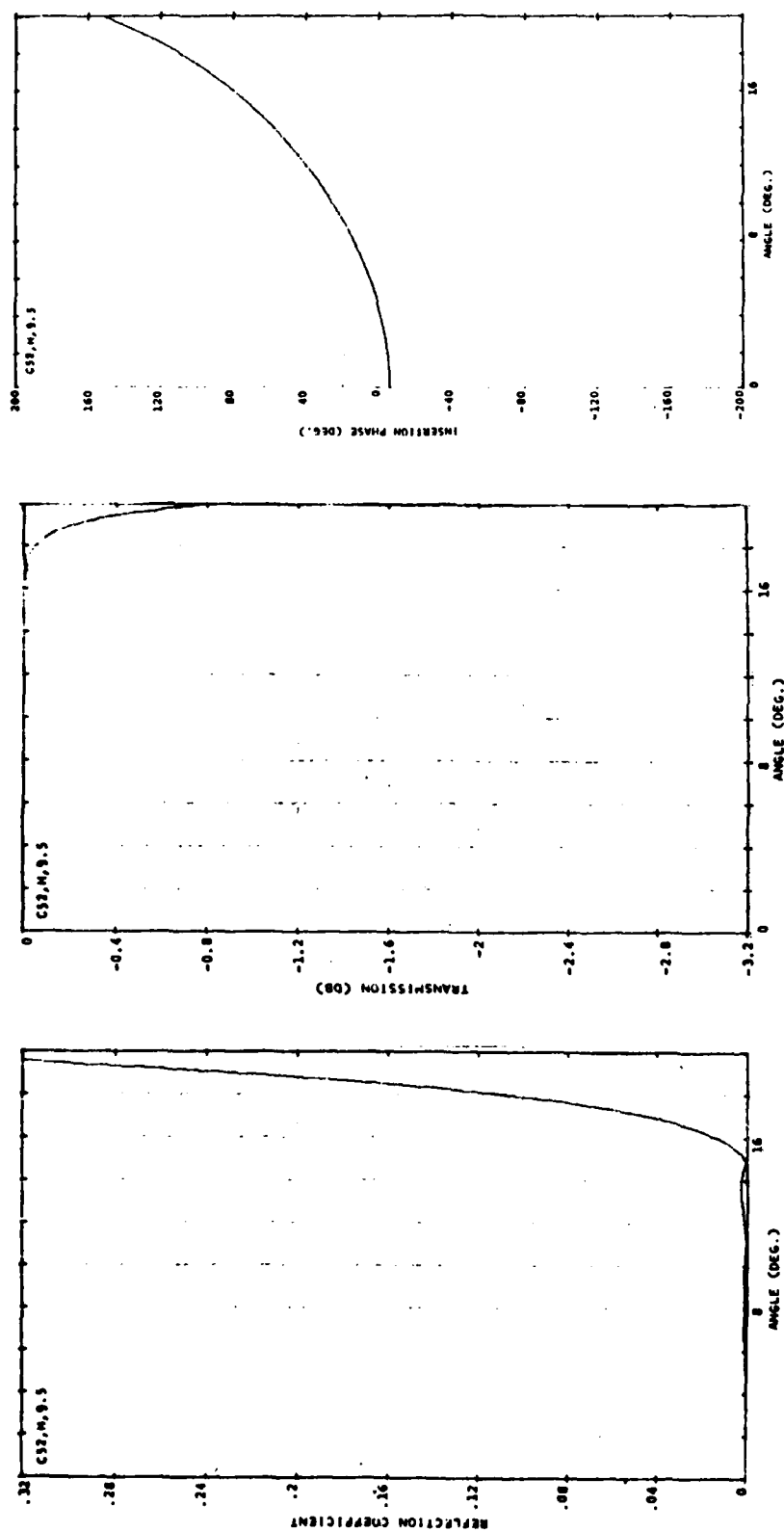


Figure A-74 Passband Reflection and Transmission, Filter C52, H Plane.

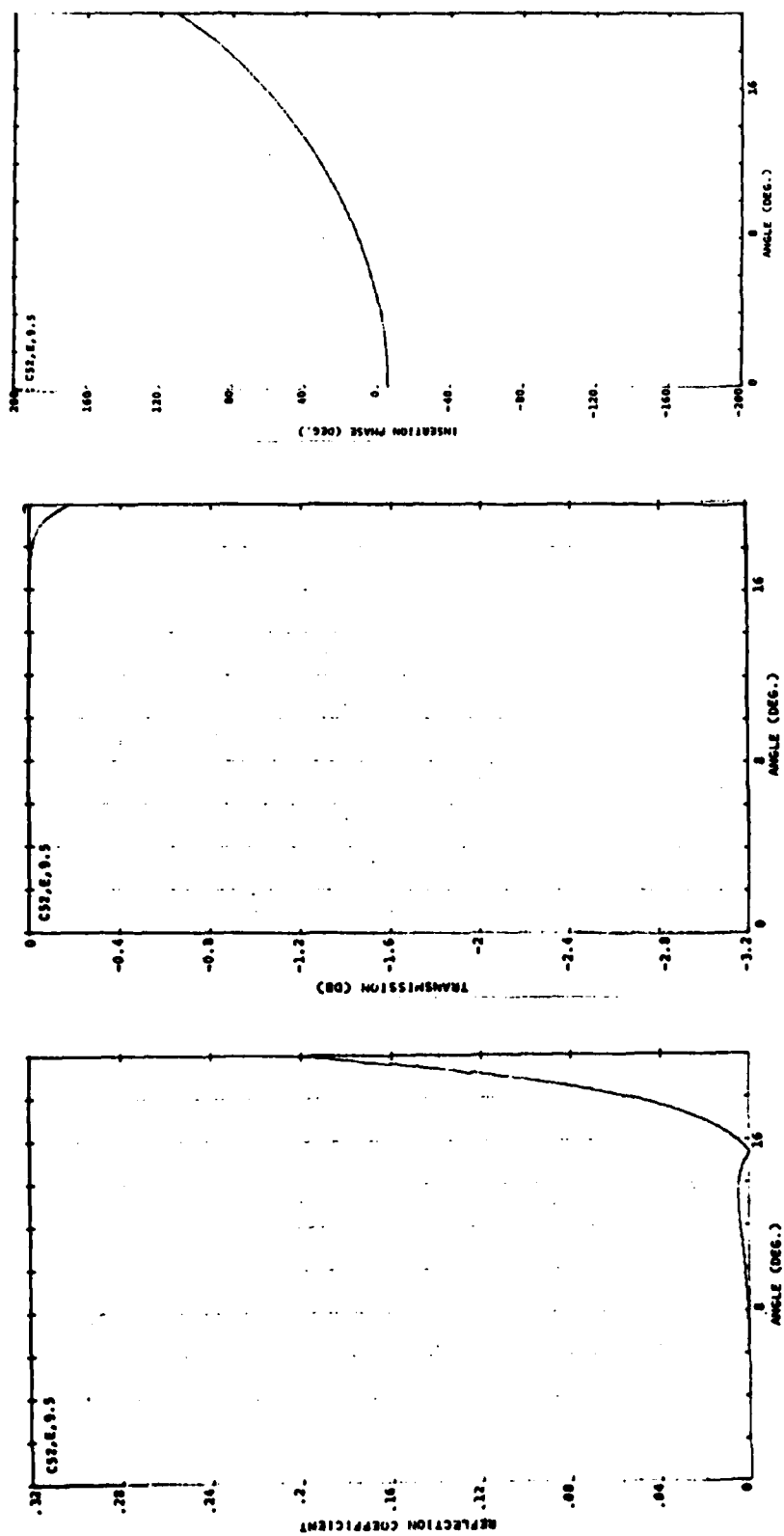
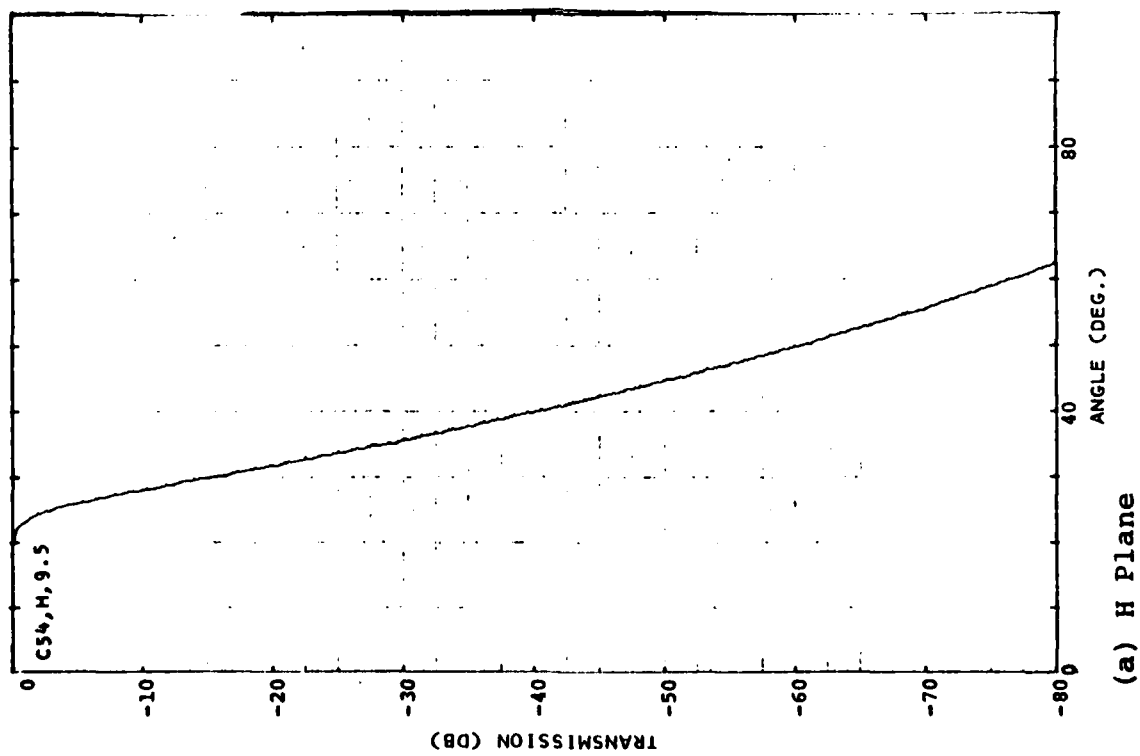
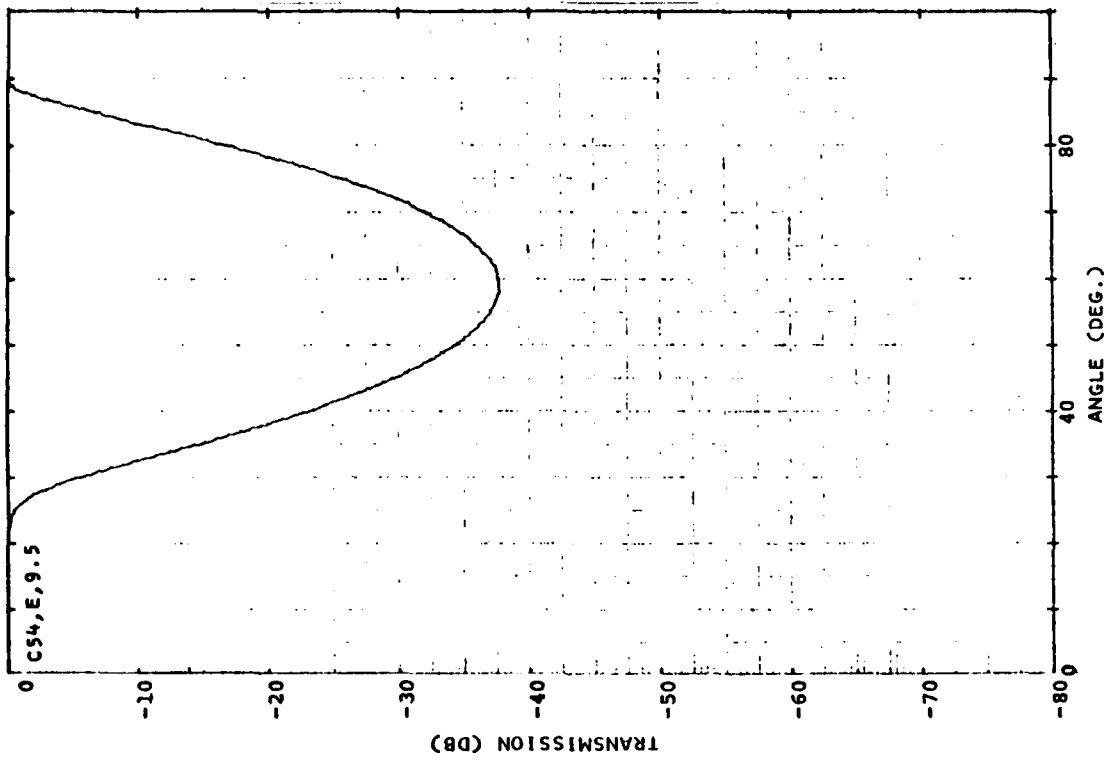


Figure A-75 Passband Reflection and Transmission, Filter C52, E Plane.



(a) H Plane



(b) E Plane

Figure A-76 Transmission, Filter C54, H and E Planes.

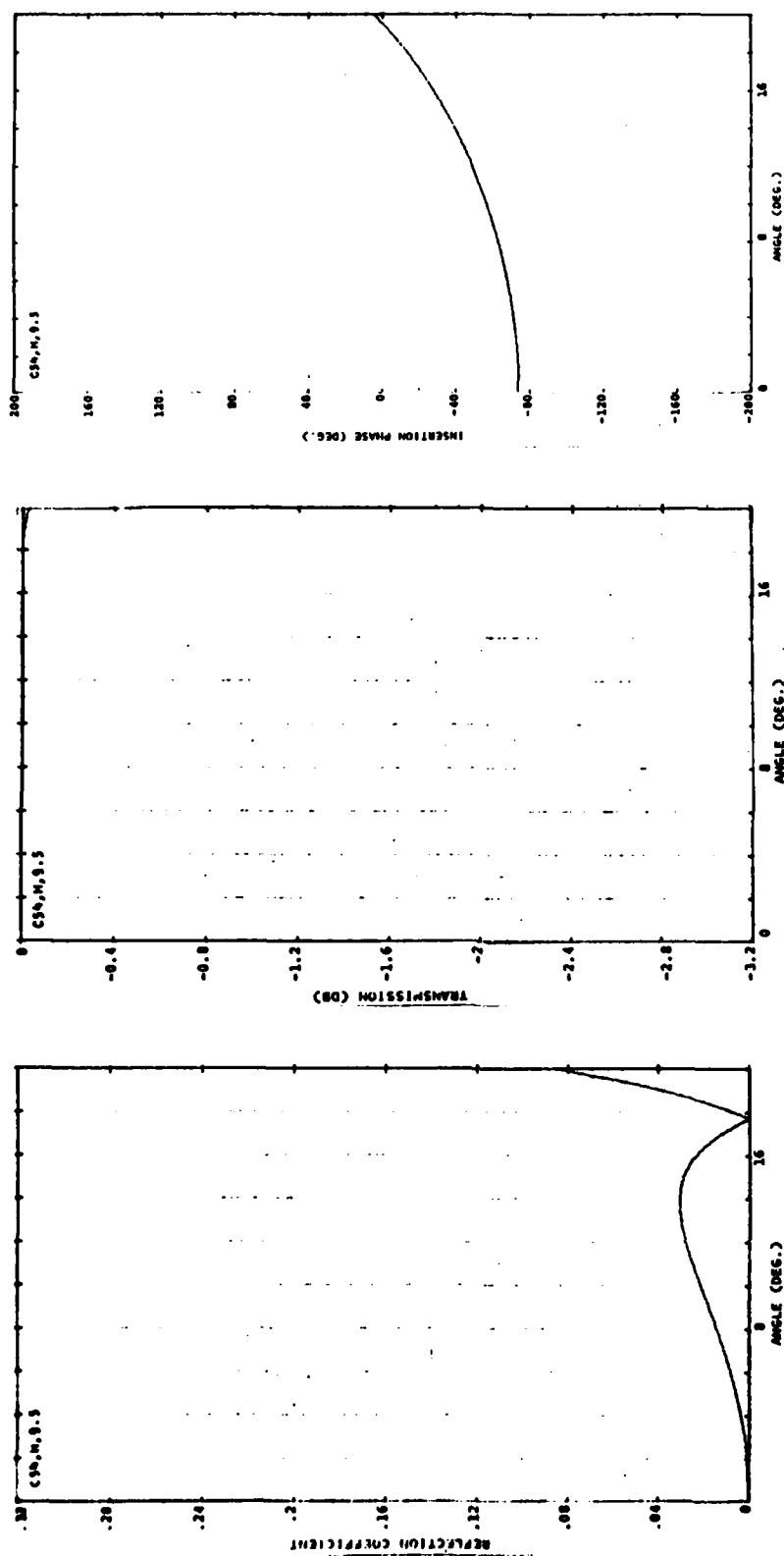


Figure A-77 Passband Reflection and Transmission, Filter C54, H Plane.

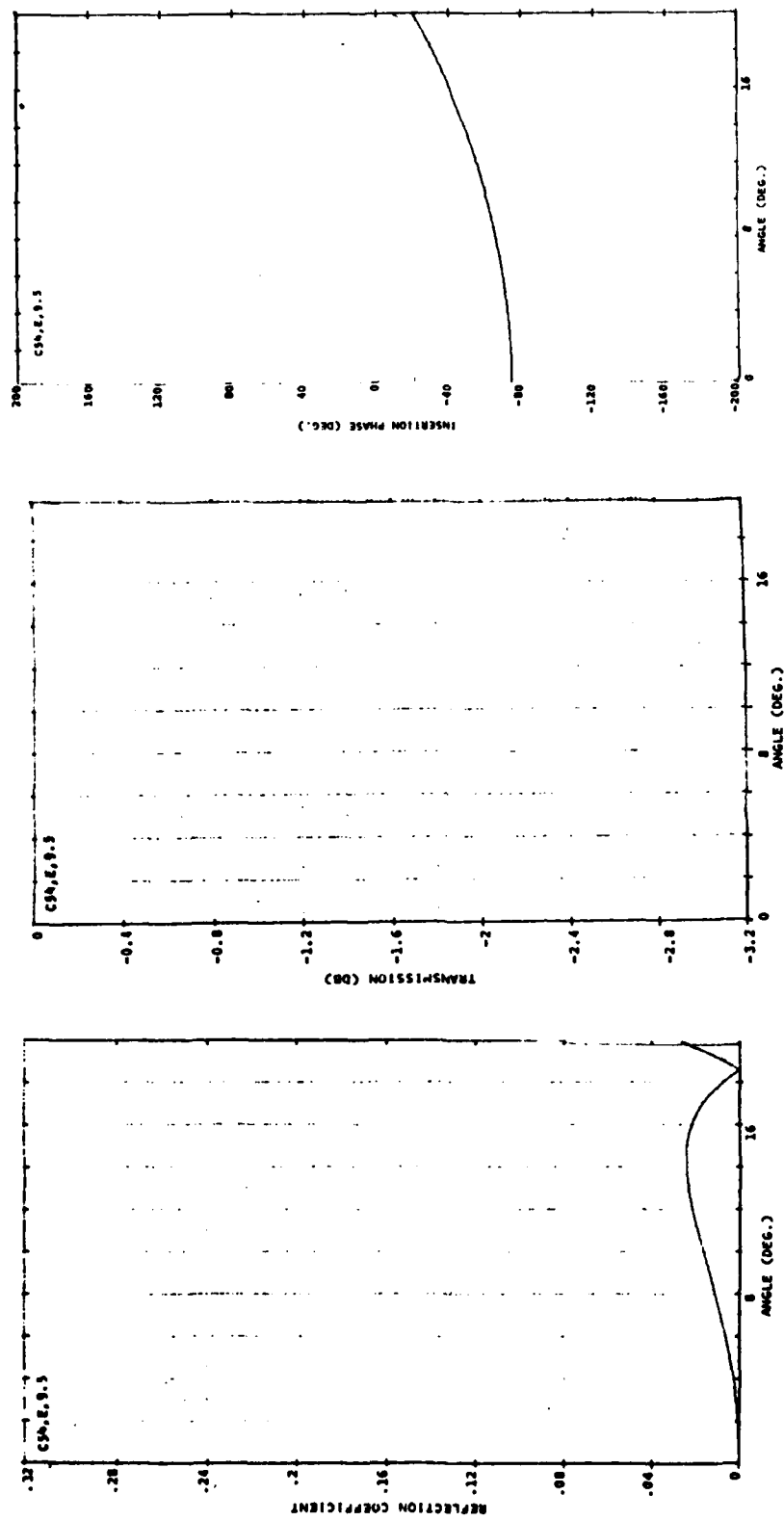
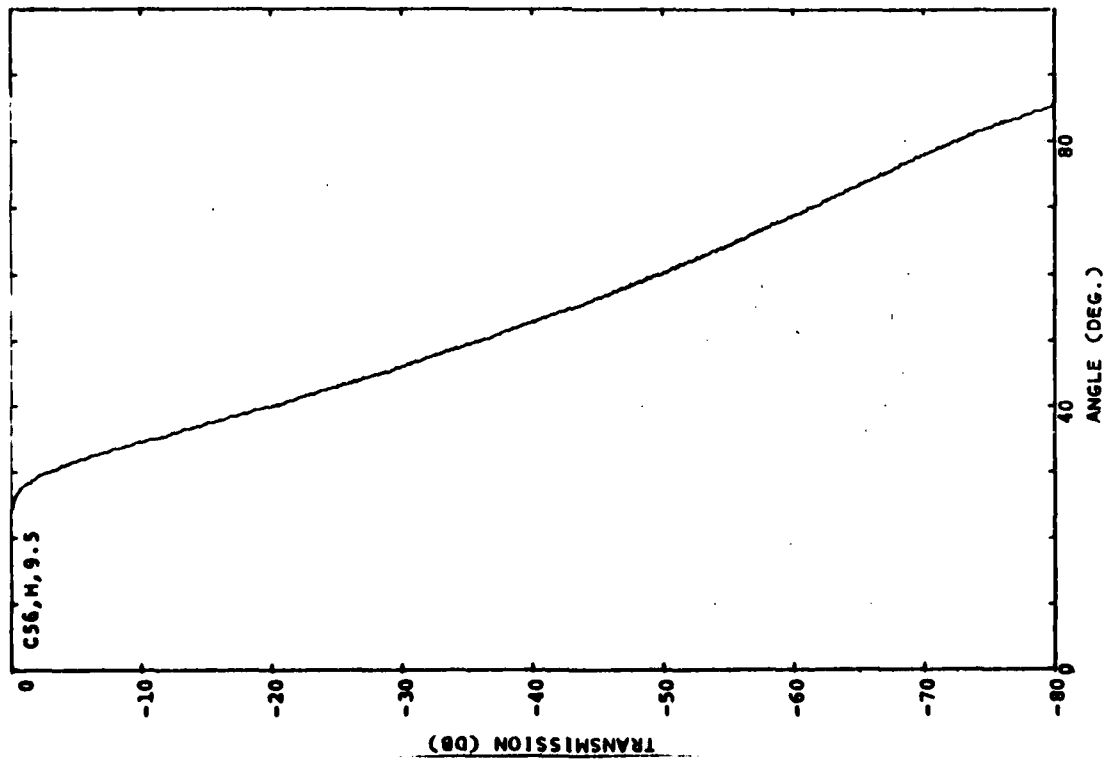
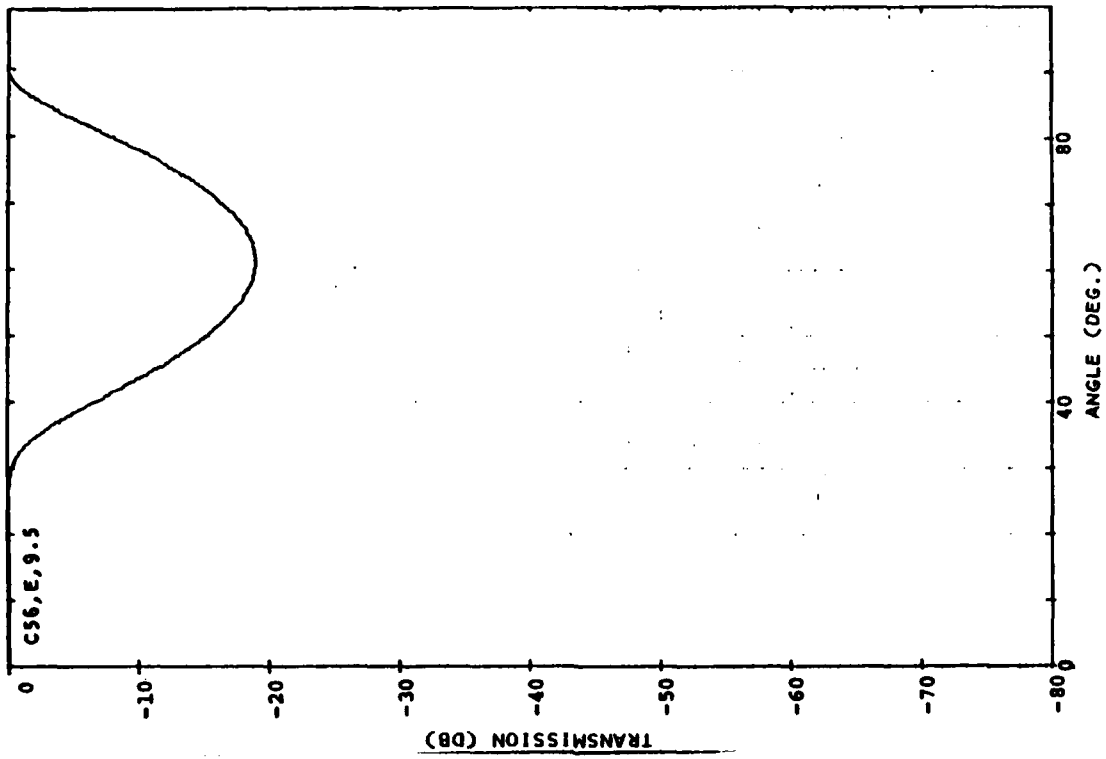


Figure A-78 Passband Reflection and Transmission, Filter C54, E Plane.



(a) H Plane



(b) E Plane

Figure A-79 Transmission, Filter C56, H and E Planes.

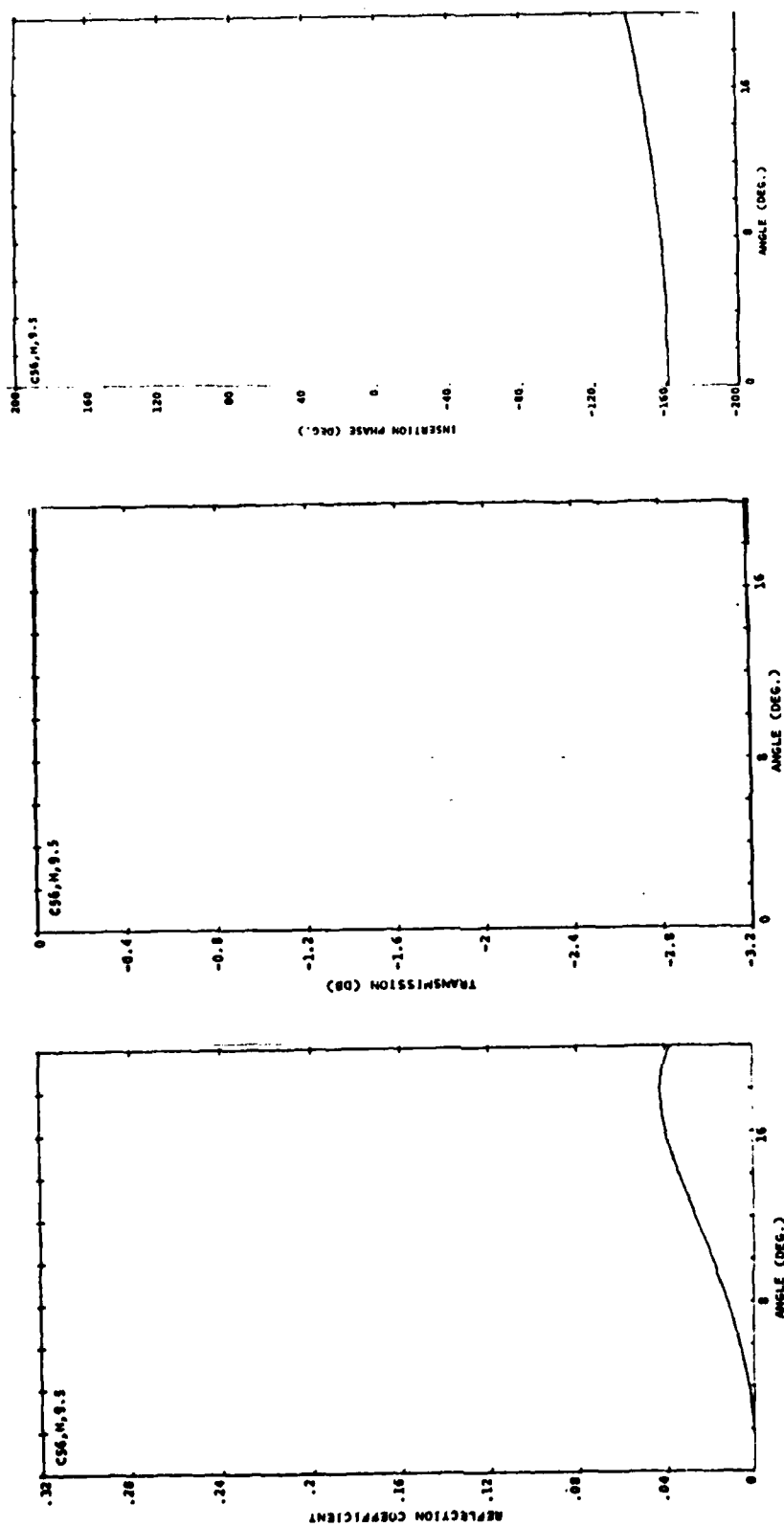


Figure A-80 Passband Reflection and Transmission, Filter C56, H Plane.

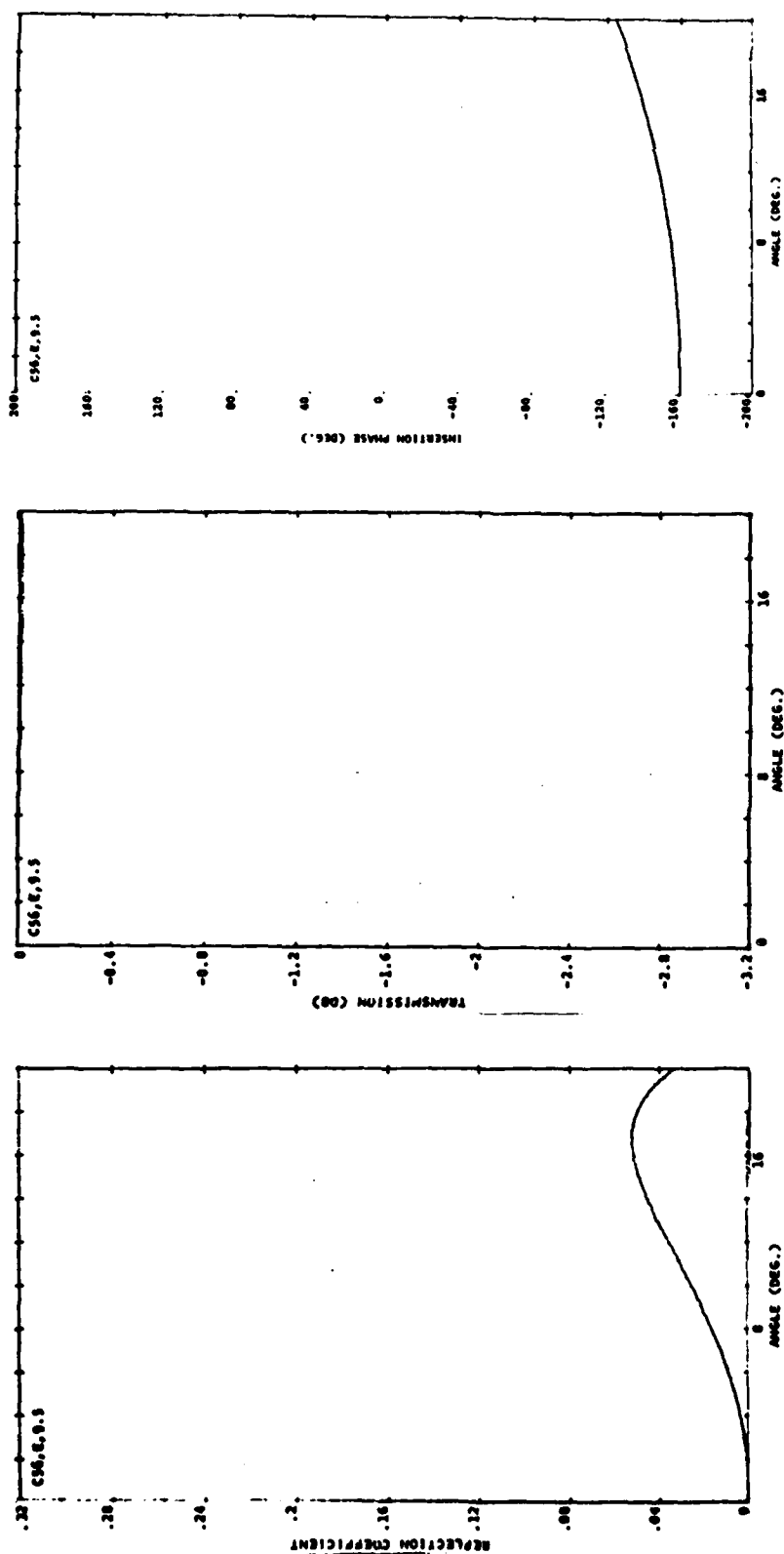
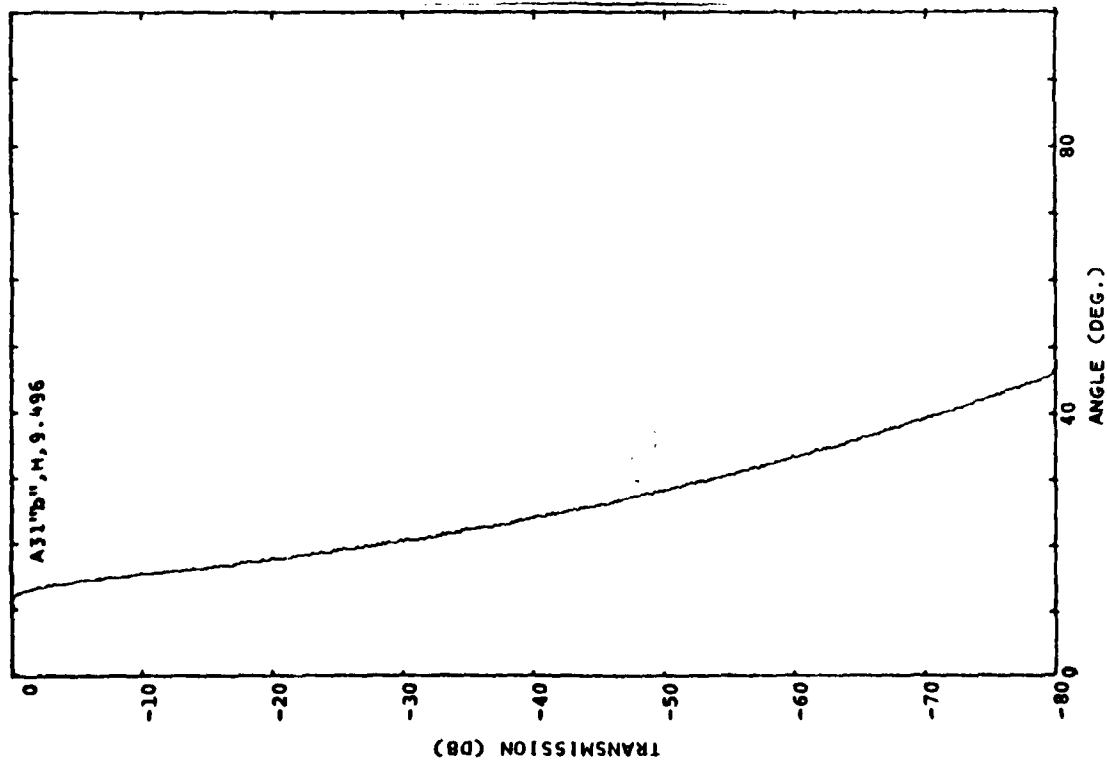
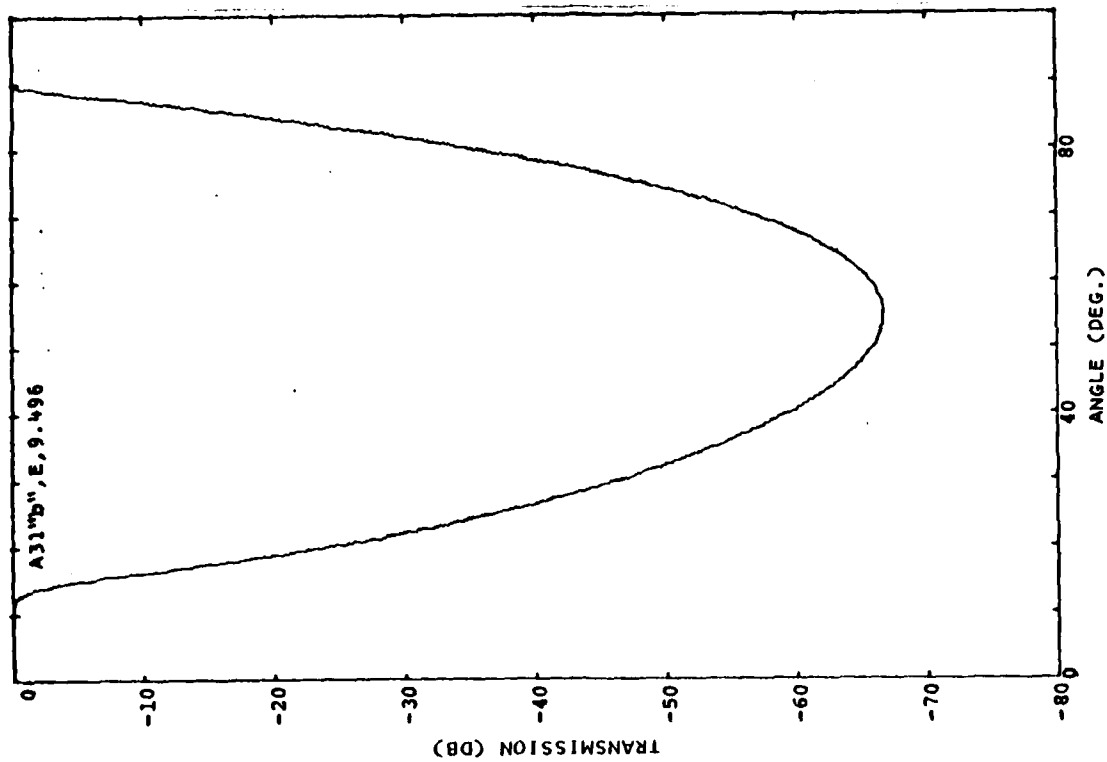


Figure A-81 Passband Reflection and Transmission, Filter C56, E Plane.



(a) H Plane



(b) E Plane

Figure A-82 Transmission, Filter A31'b", H and E Planes.

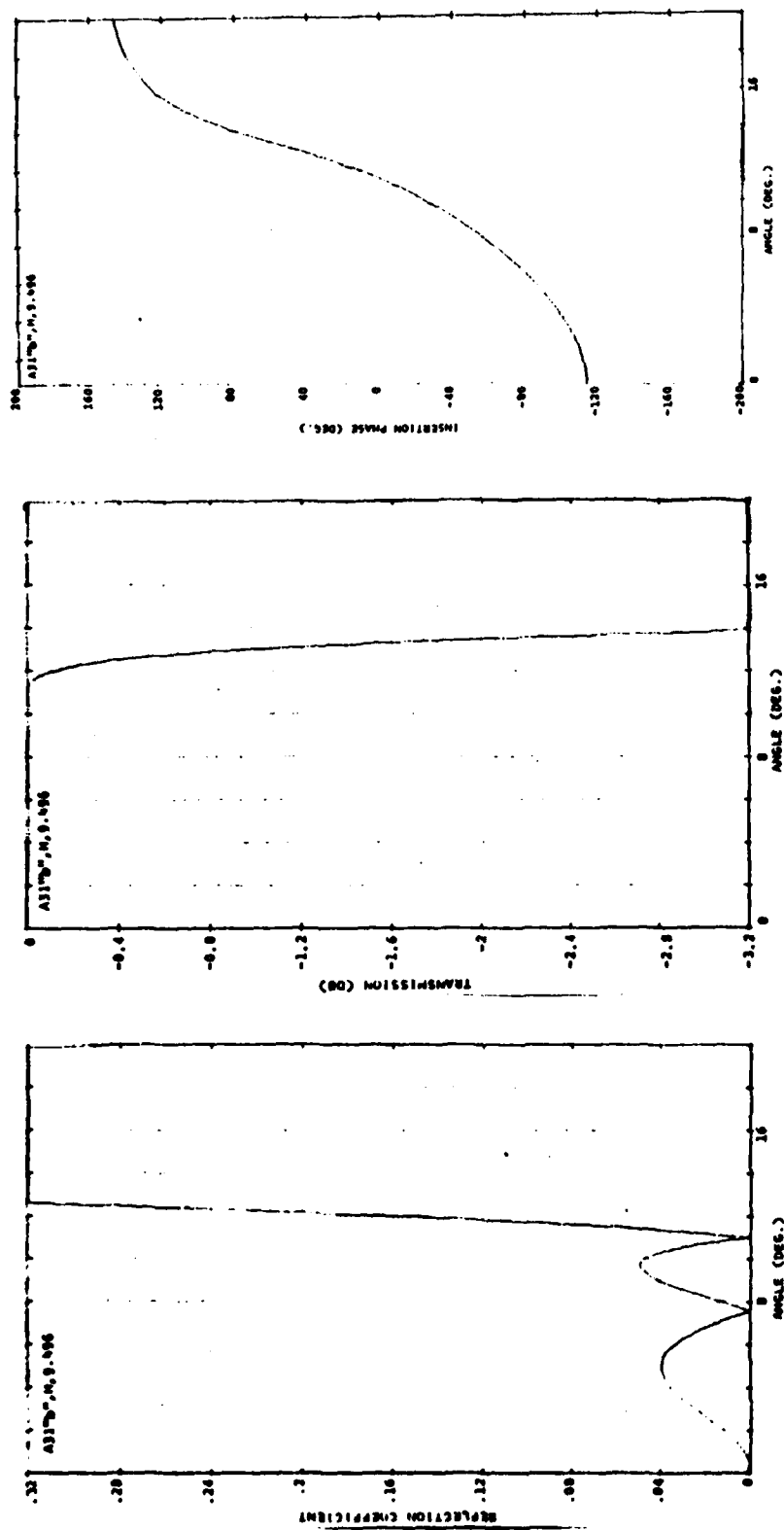


Figure A-83 Passband Reflection and Transmission, Filter A31'b", H Plane.

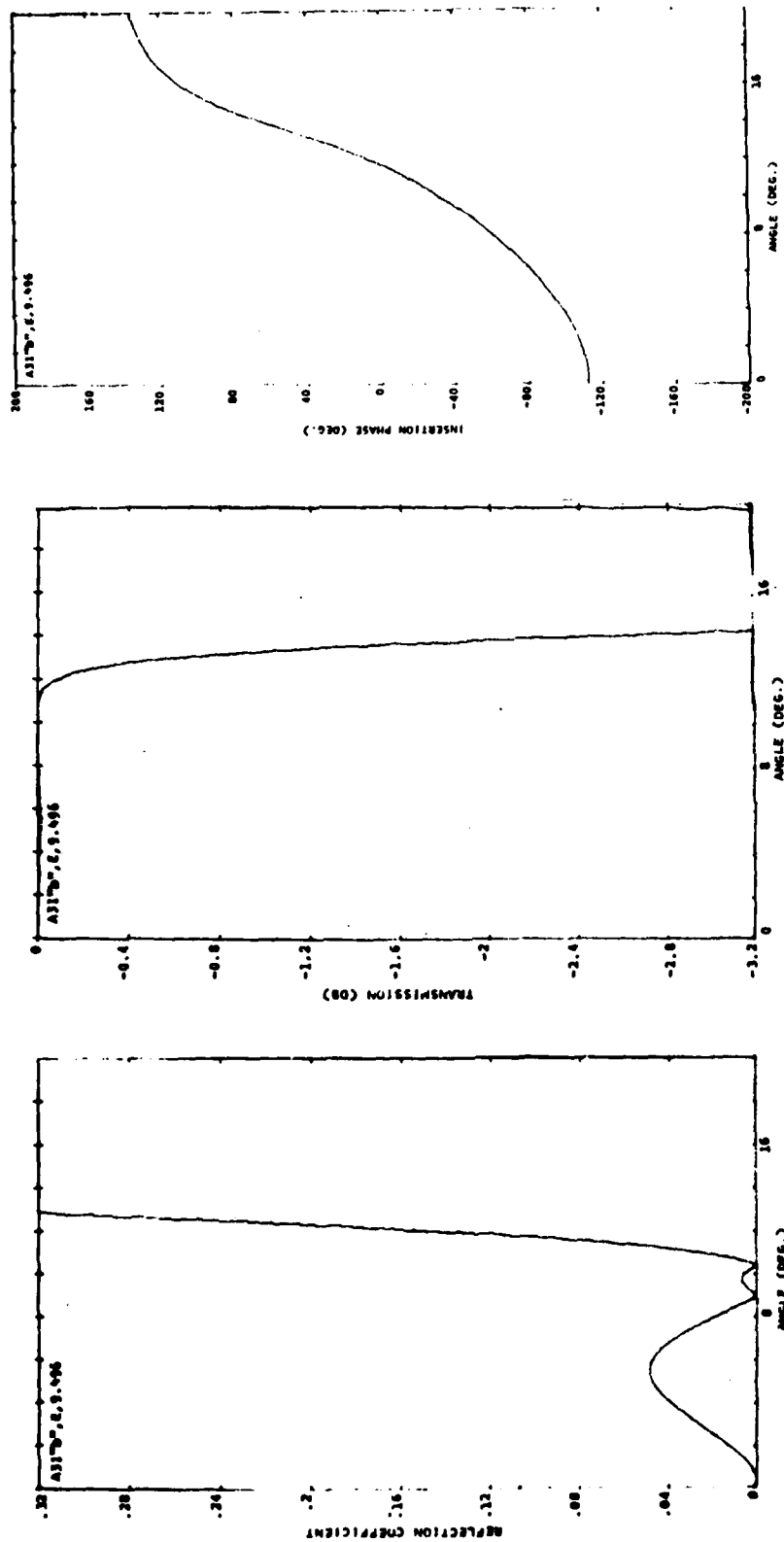
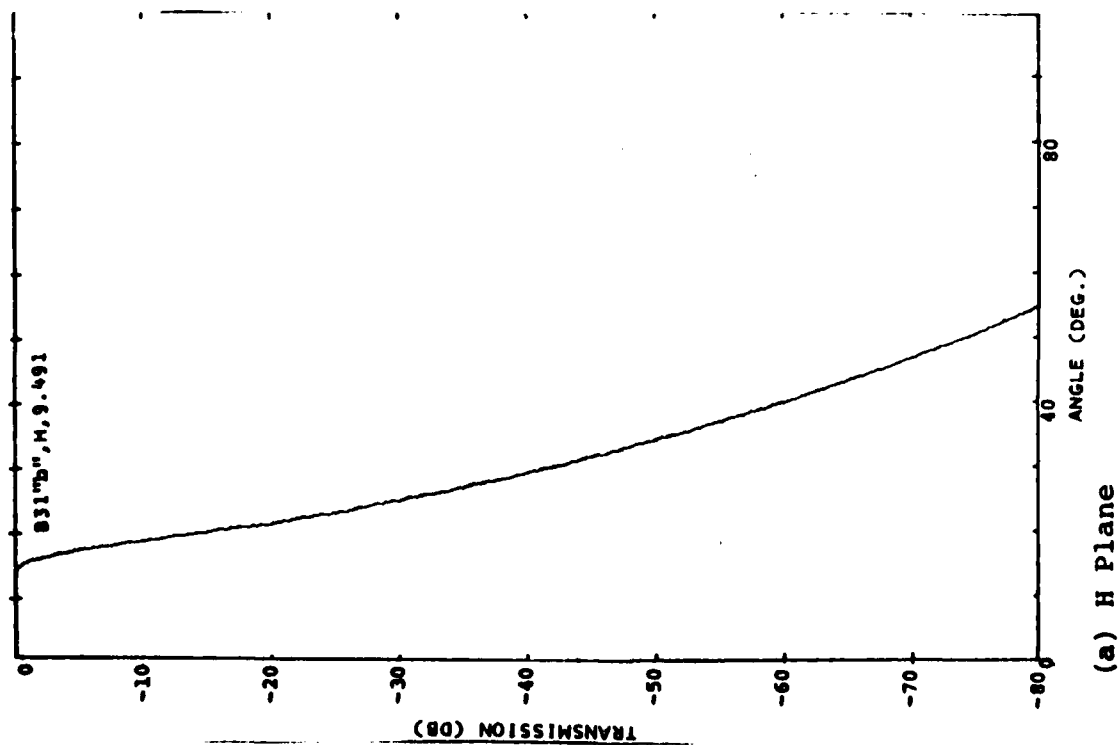
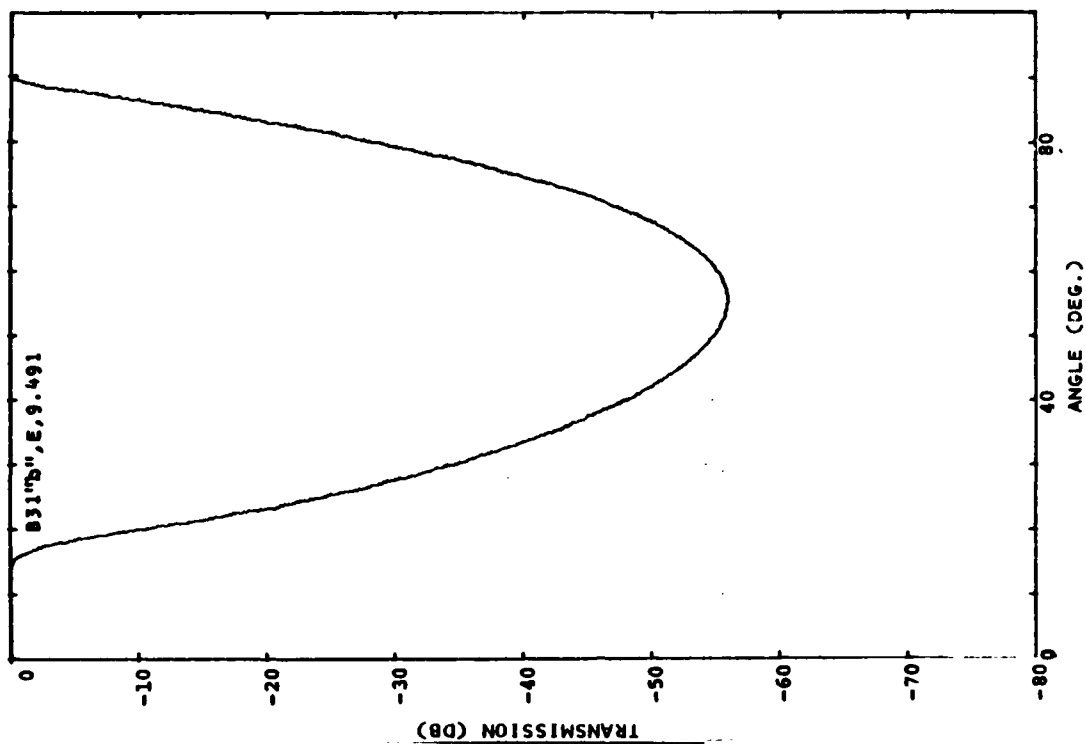


Figure A-84 Passband Reflection and Transmission, Filter A31"b", E Plane.



(a) H Plane



(b) E Plane

Figure A-85 Transmission, Filter B31'b", H and E Planes.

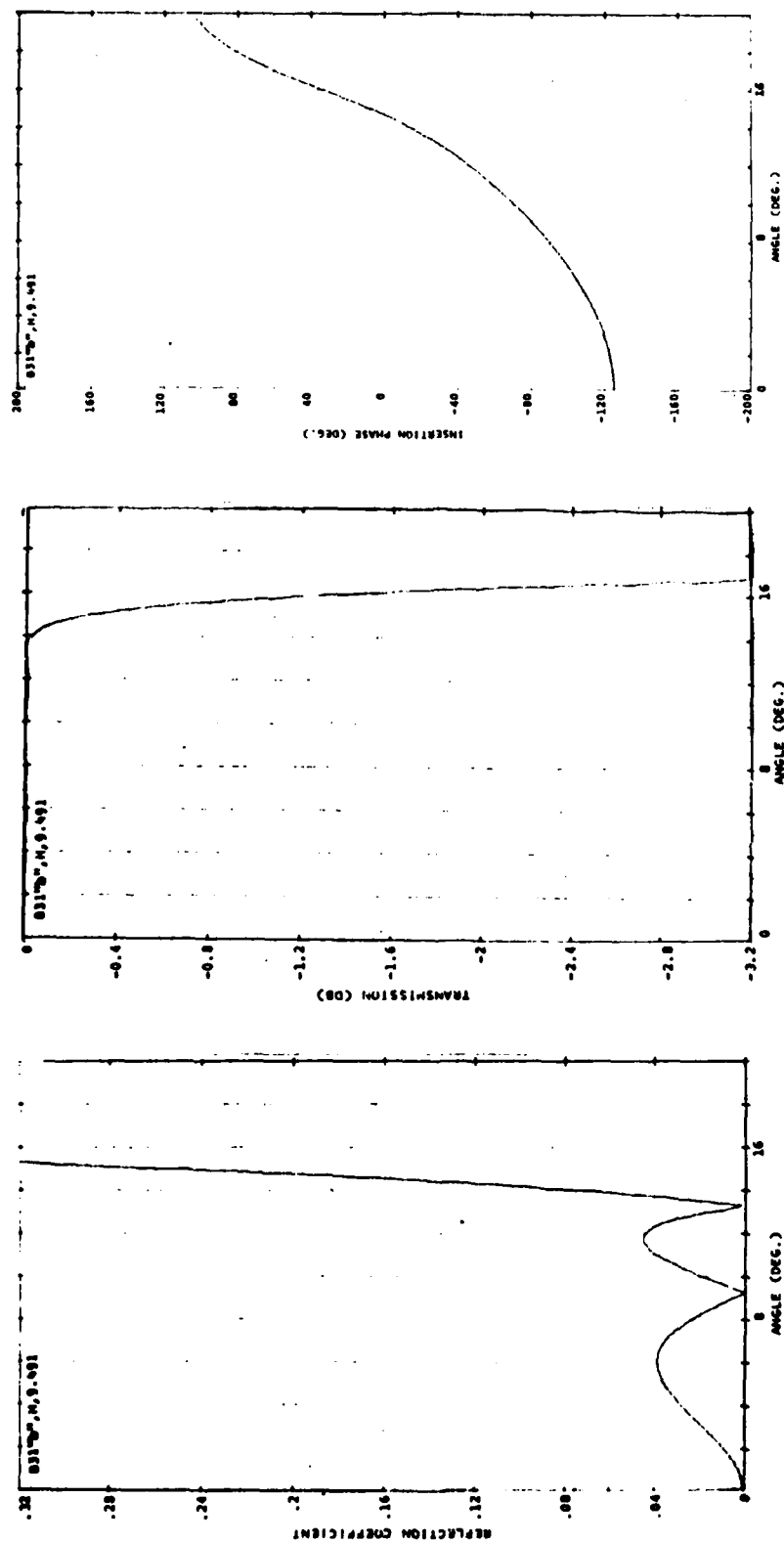


Figure A-86 Passband Reflection and Transmission, Filter B31"b", H Plane.

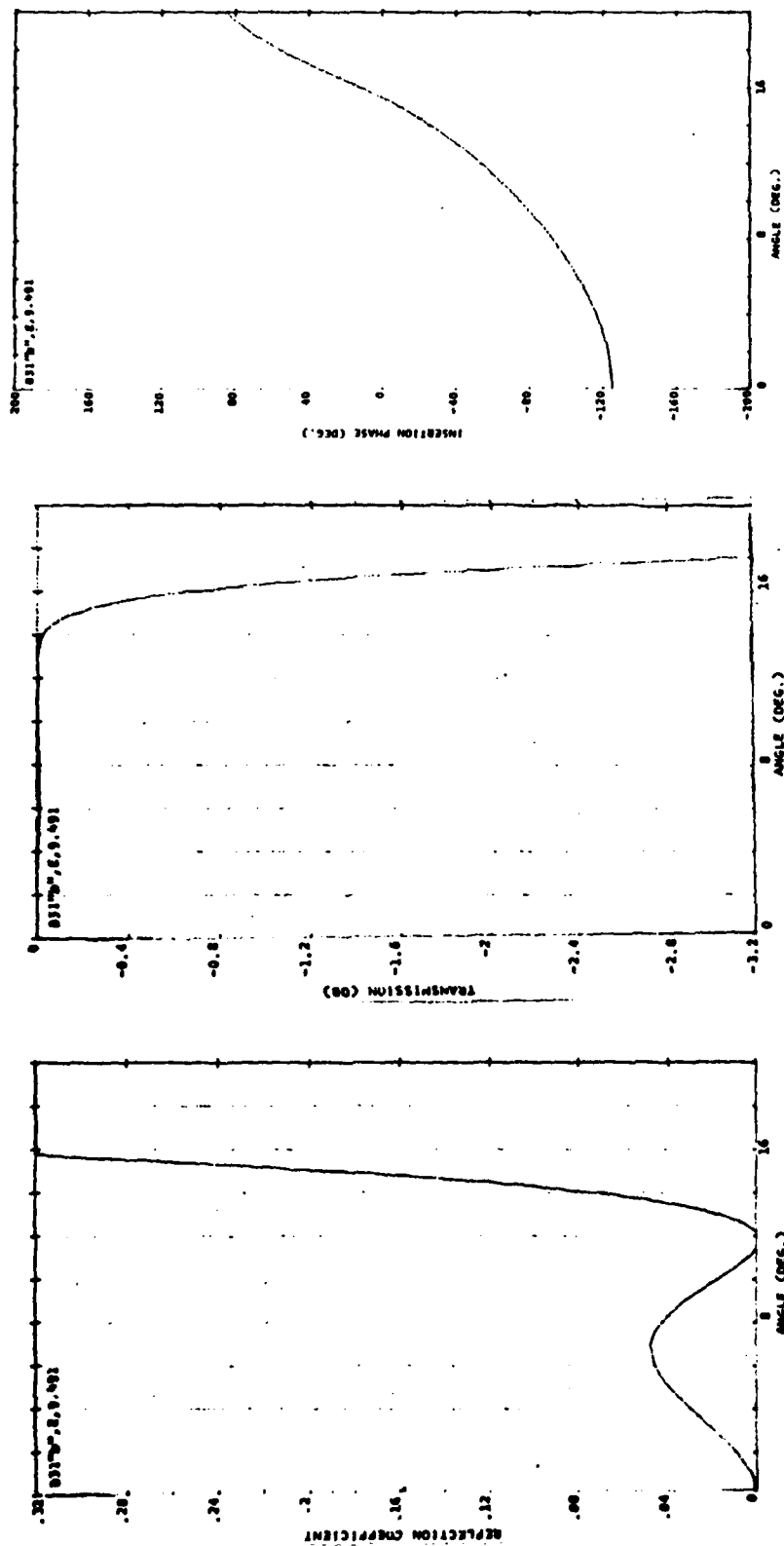
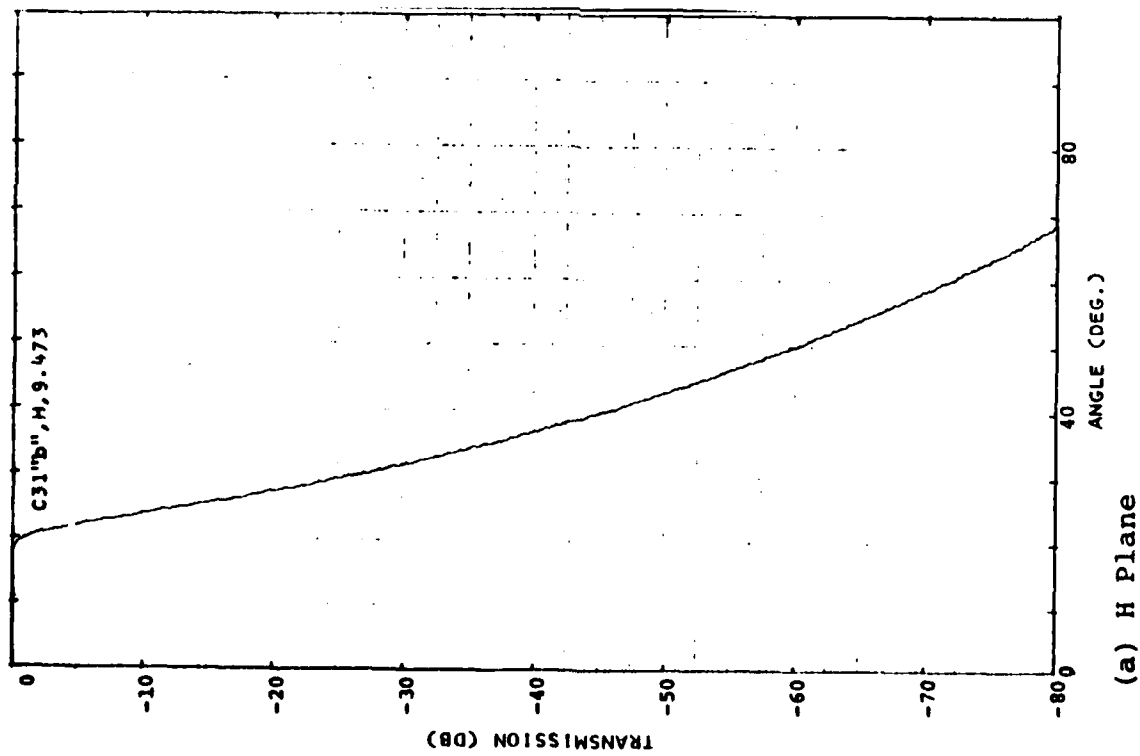
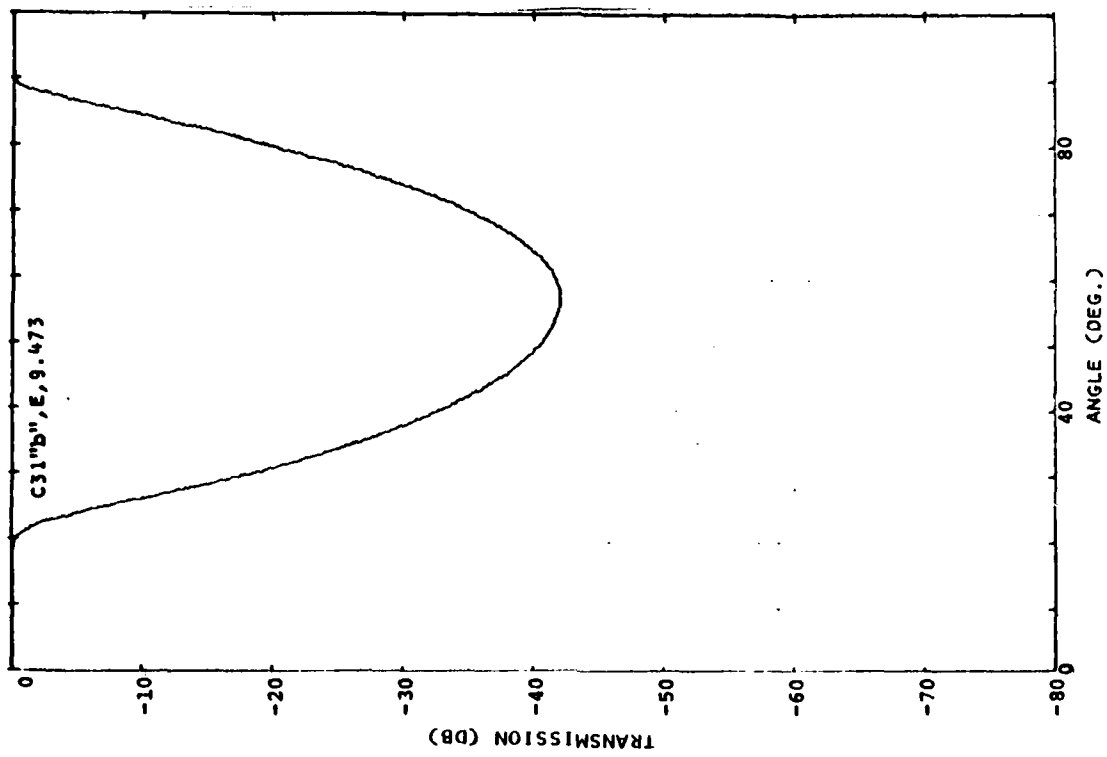


Figure A-87 Passband Reflection and Transmission, Filter B31'b", E Plane.



(a) H Plane



(b) E Plane

Figure A-88 Transmission, Filter C31'b", H and E Planes.

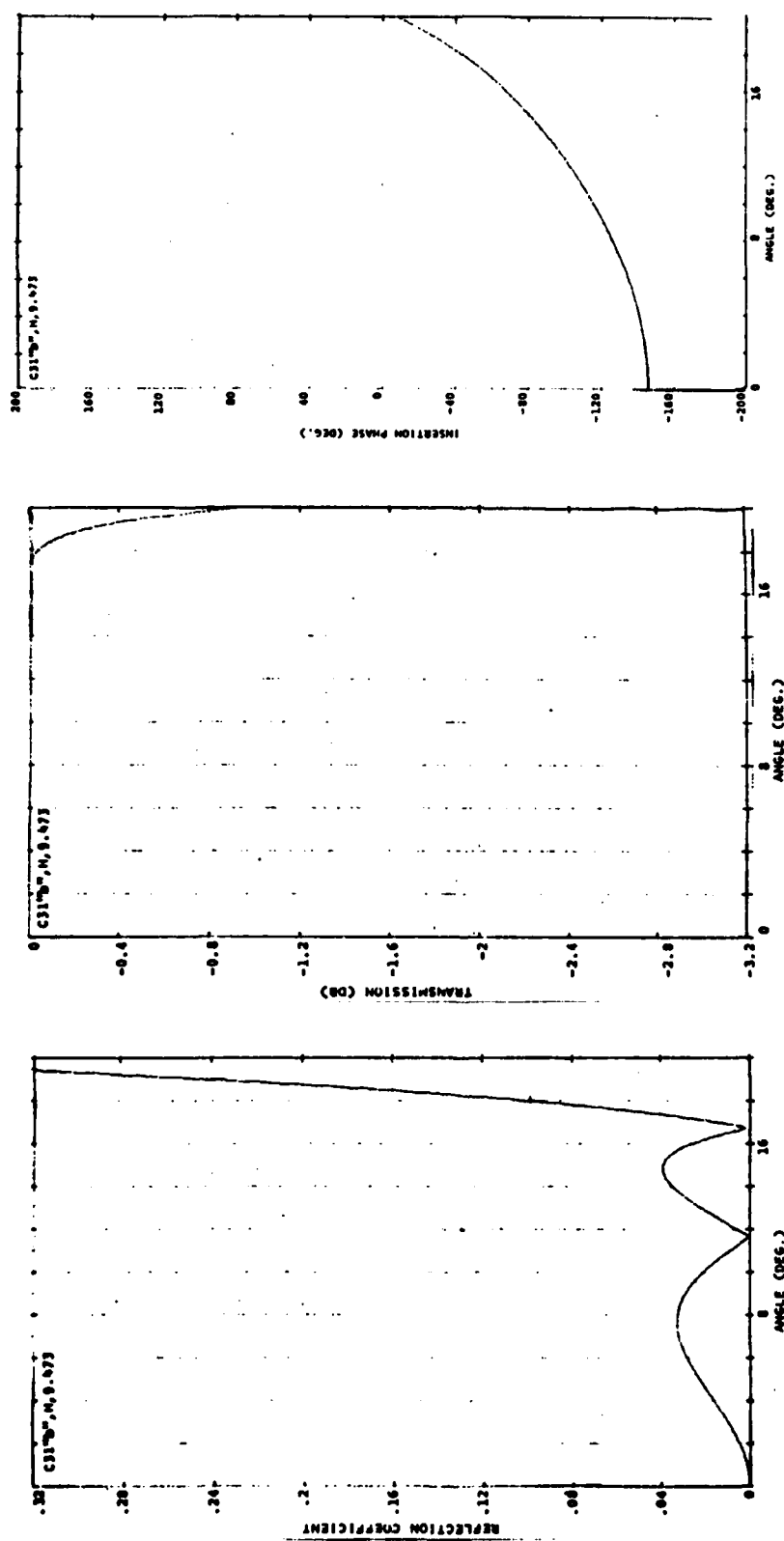


Figure A-89 Passband Reflection and Transmission, Filter C31'b", H Plane.

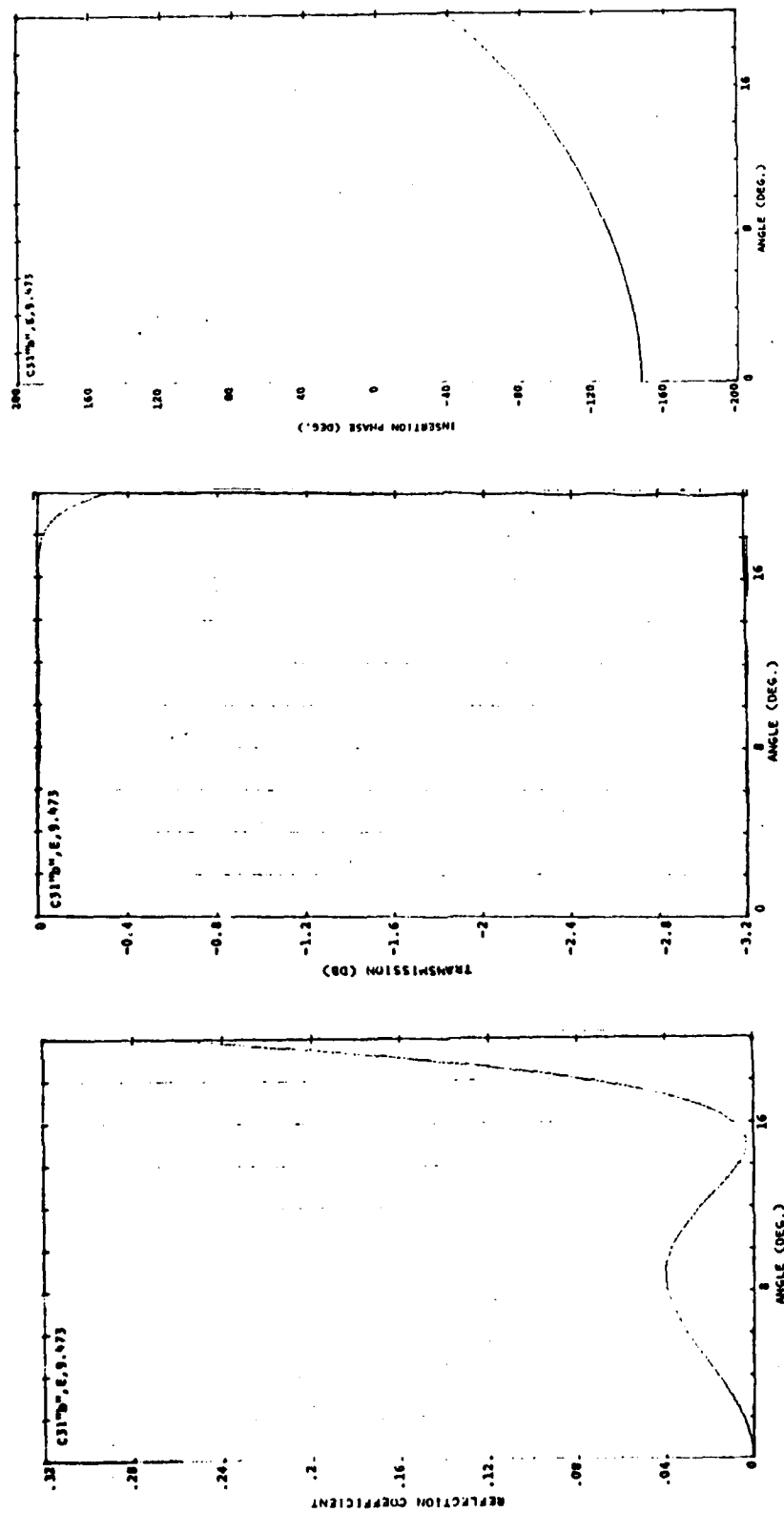


Figure A-90 Passband Reflection and Transmission, Filter C31"b", E Plane.

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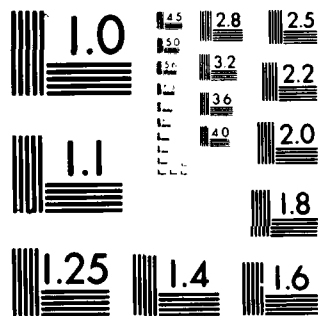
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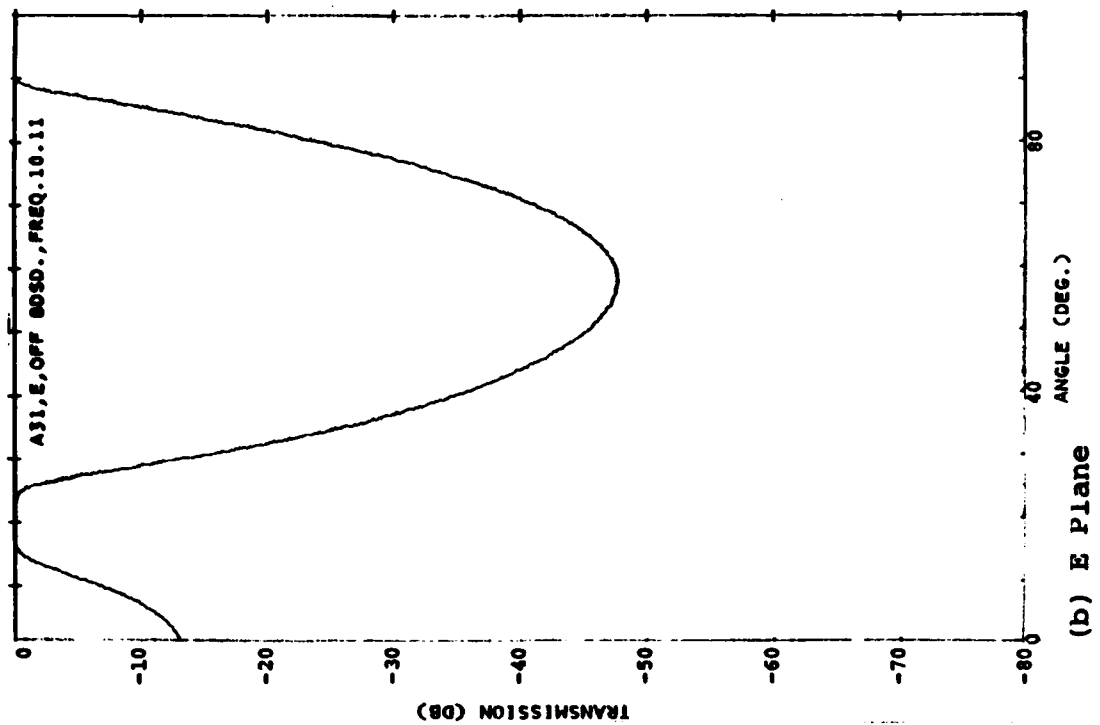
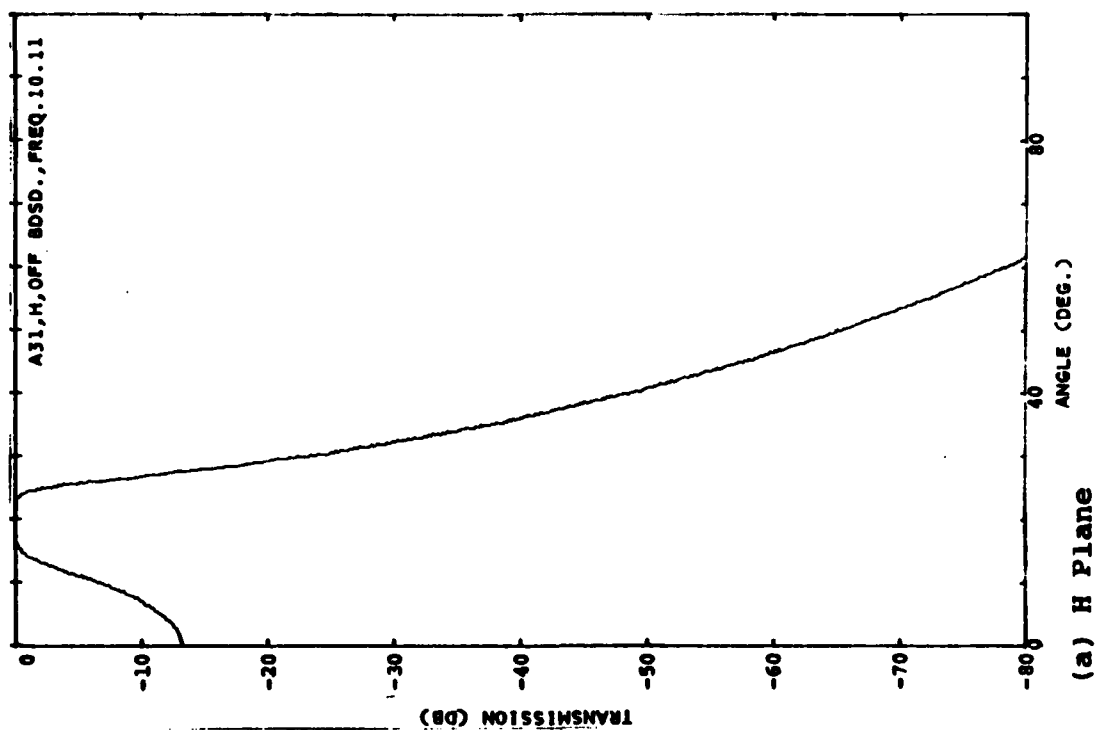


Figure A-91 Transmission, Filter A31"O" 20°, H and E Planes.

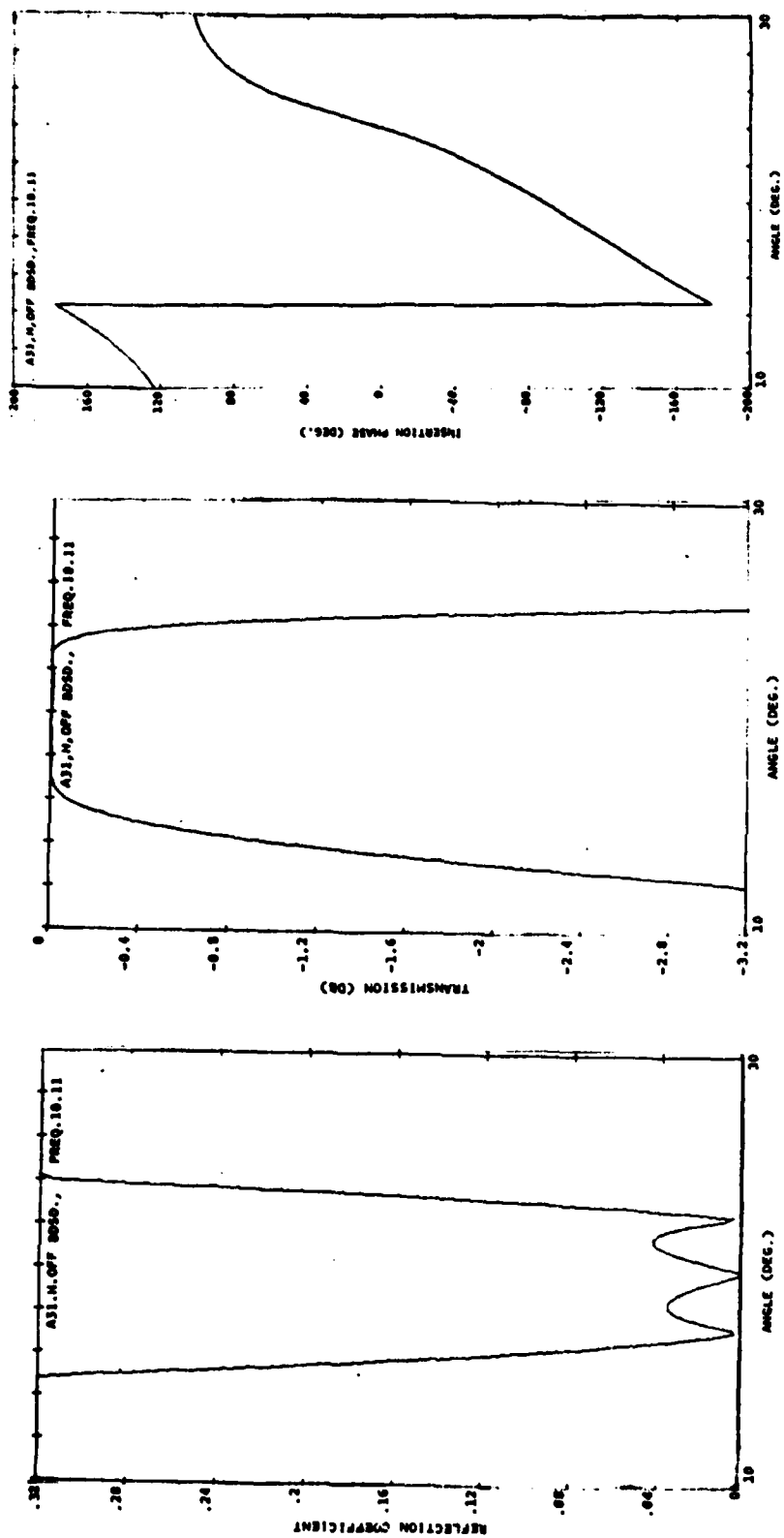


Figure A-92 Passband Reflection and Transmission, Filter A31"o" 20°, H Plane.

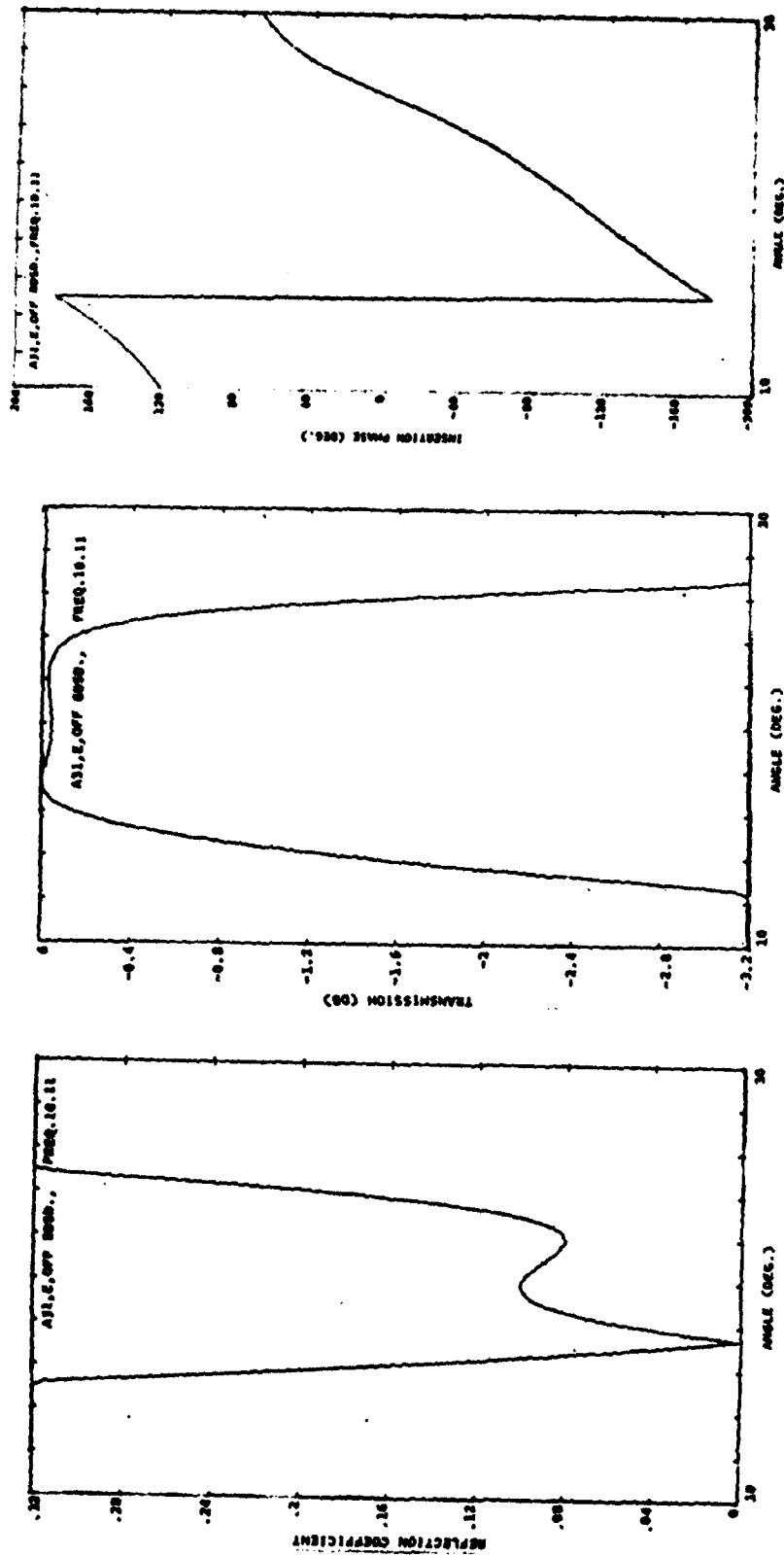


Figure A-93 Passband Reflection and Transmission, Filter A31"o" 20°, E Plane.

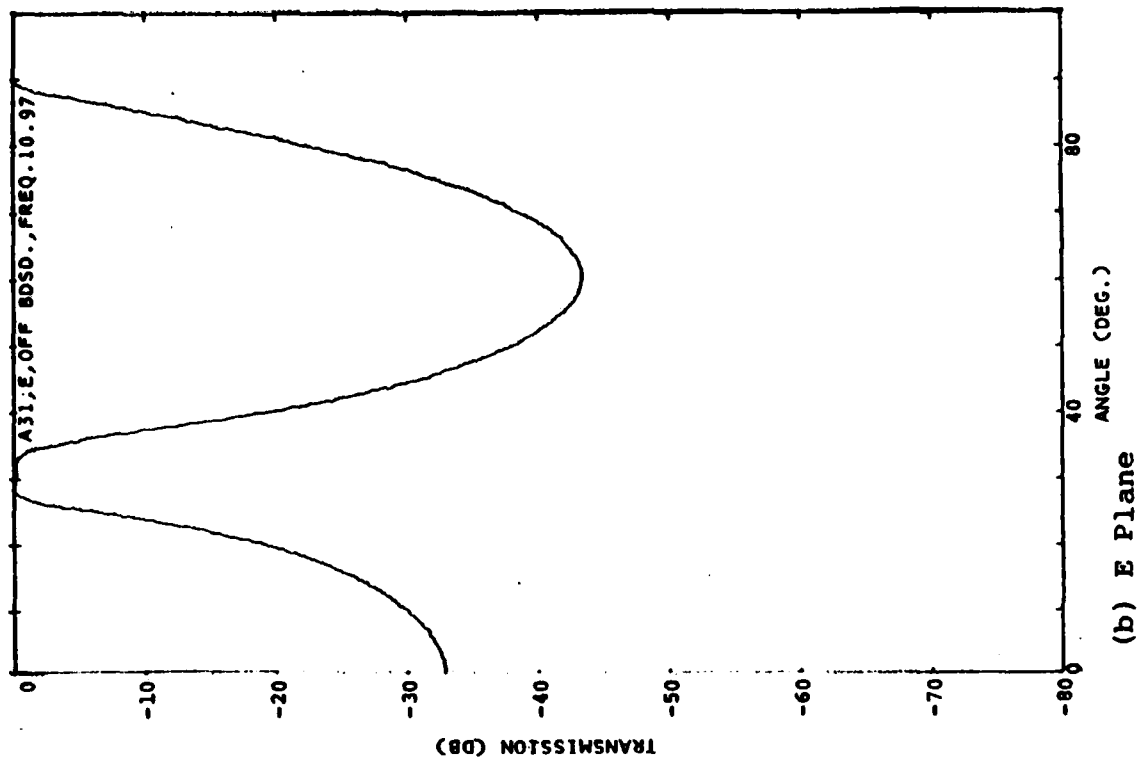
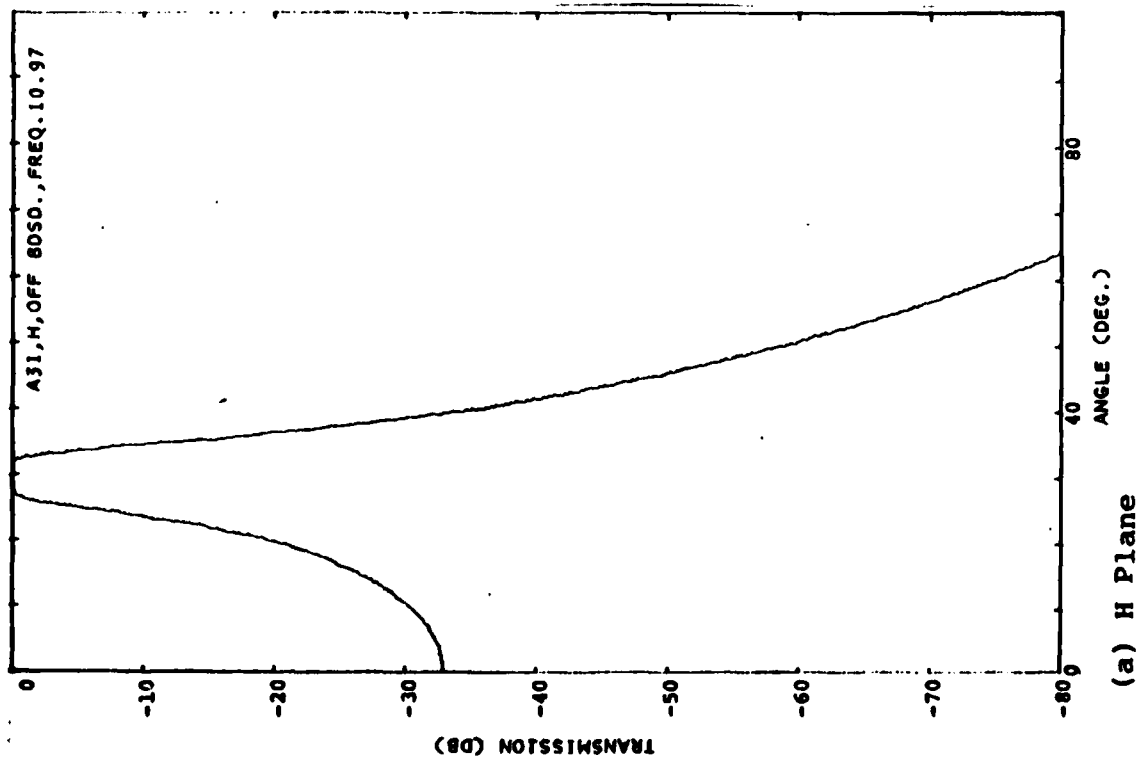


Figure A-94 Transmission, Filter A31"o" 30°, H and E Planes.

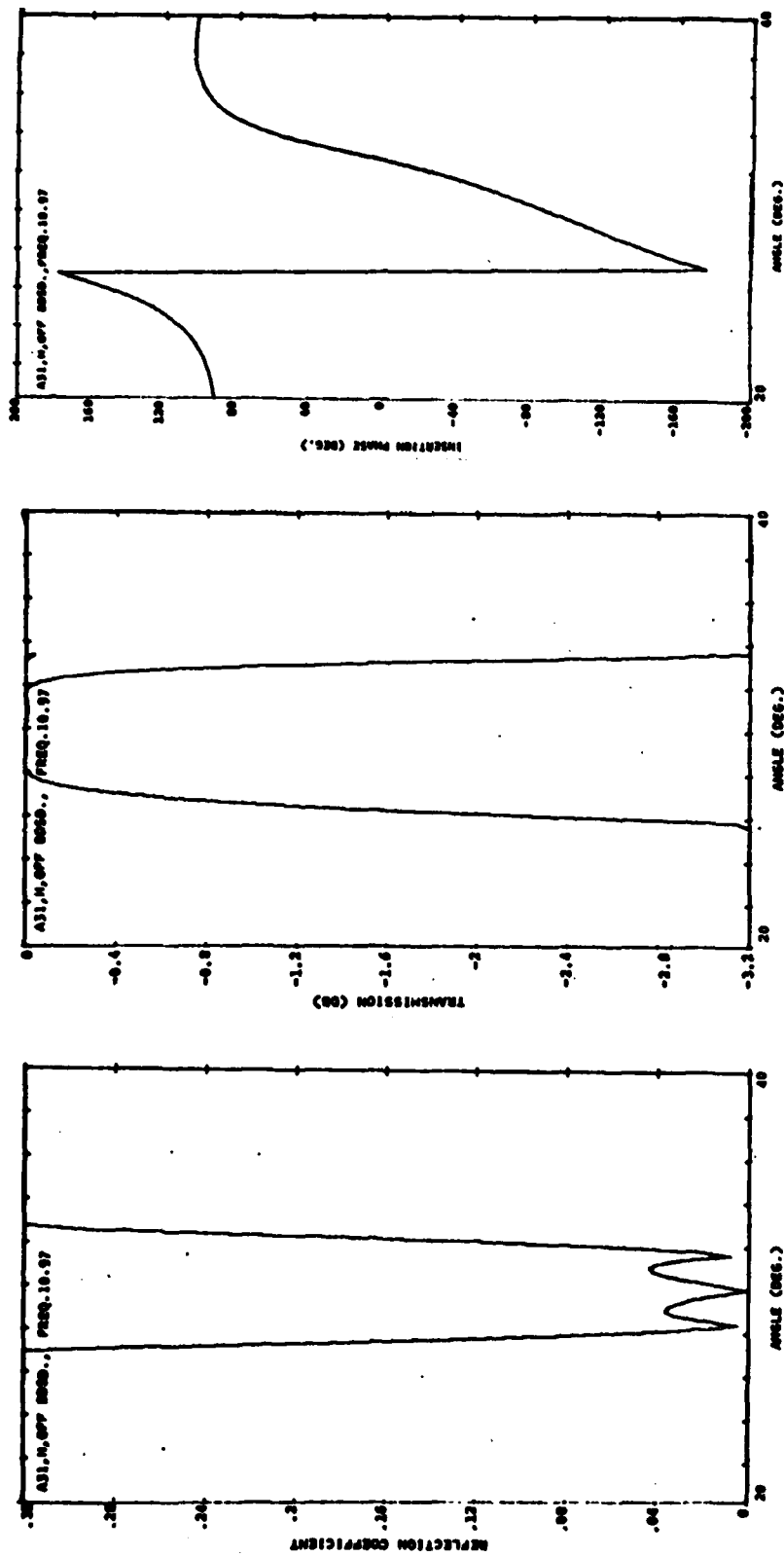


Figure A-95 Passband Reflection and Transmission, Filter A31 "o" 30°, H Plane.

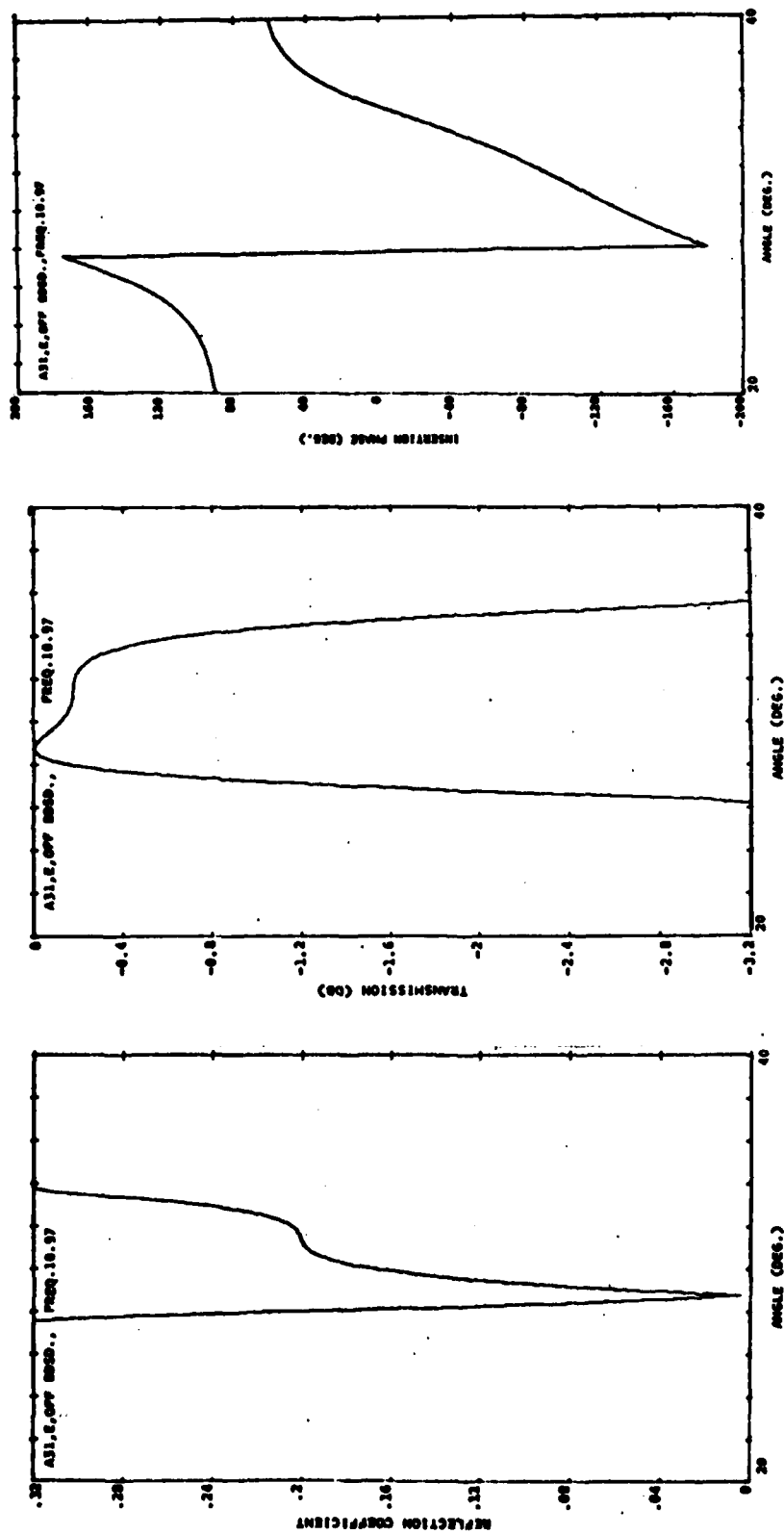
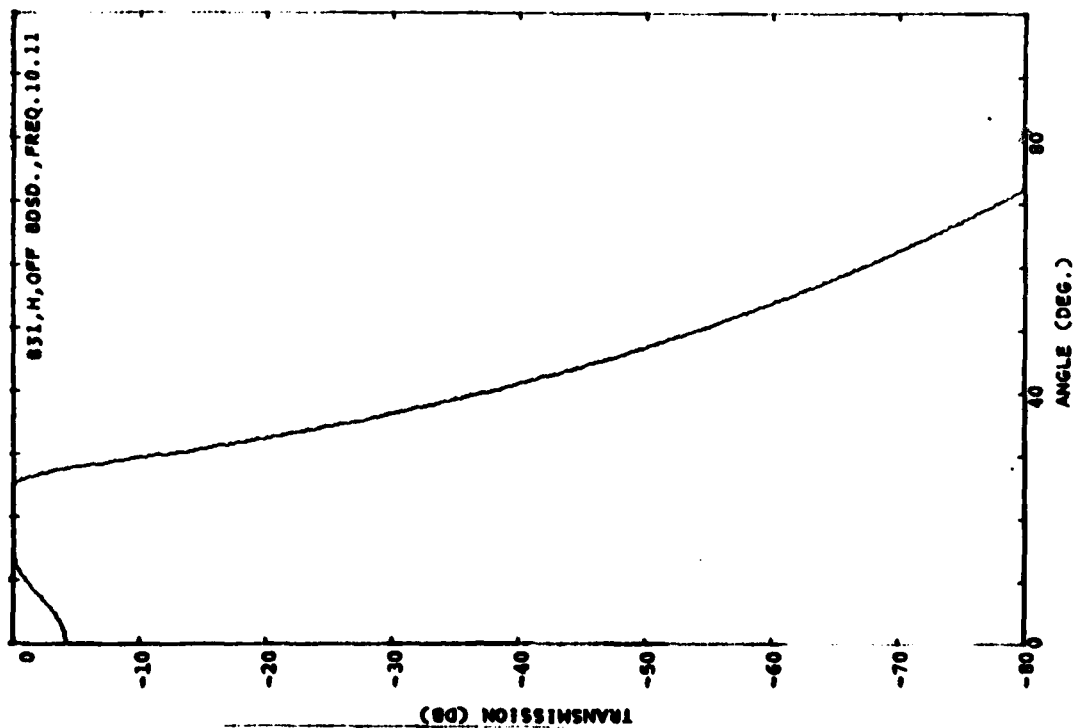
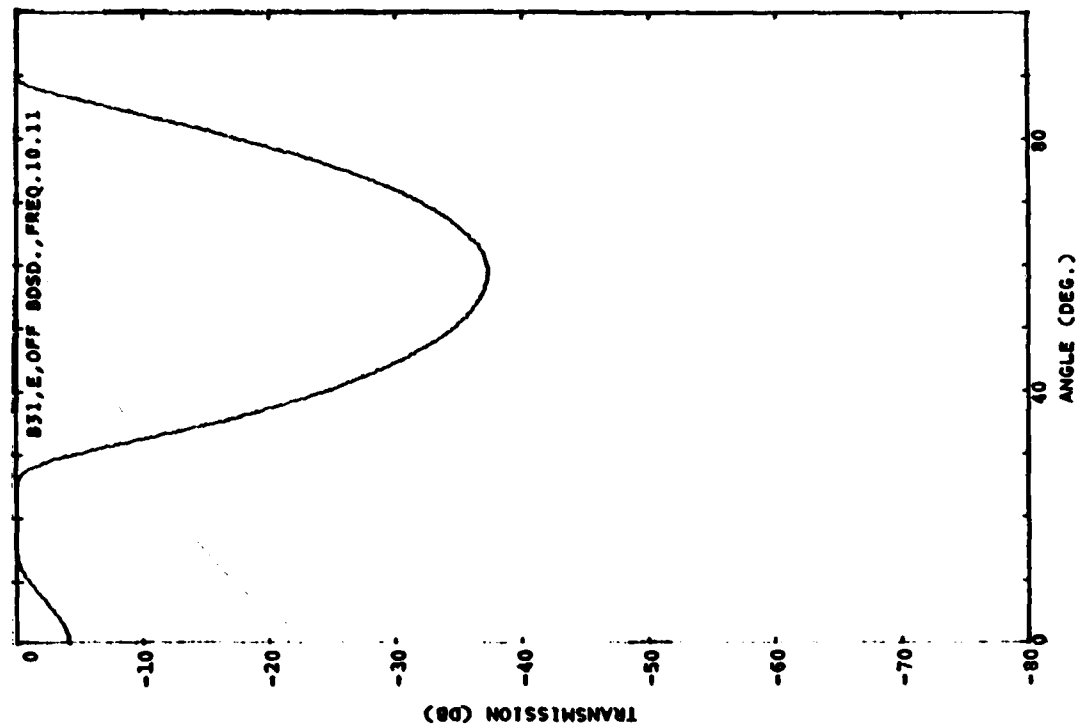


Figure A-96 Passband Reflection and Transmission, Filter A31"o" 30°, E Plane.



(a) H Plane



(b) E Plane

Figure A-97 Transmission, Filter B31"O" 20°, H and E Planes.

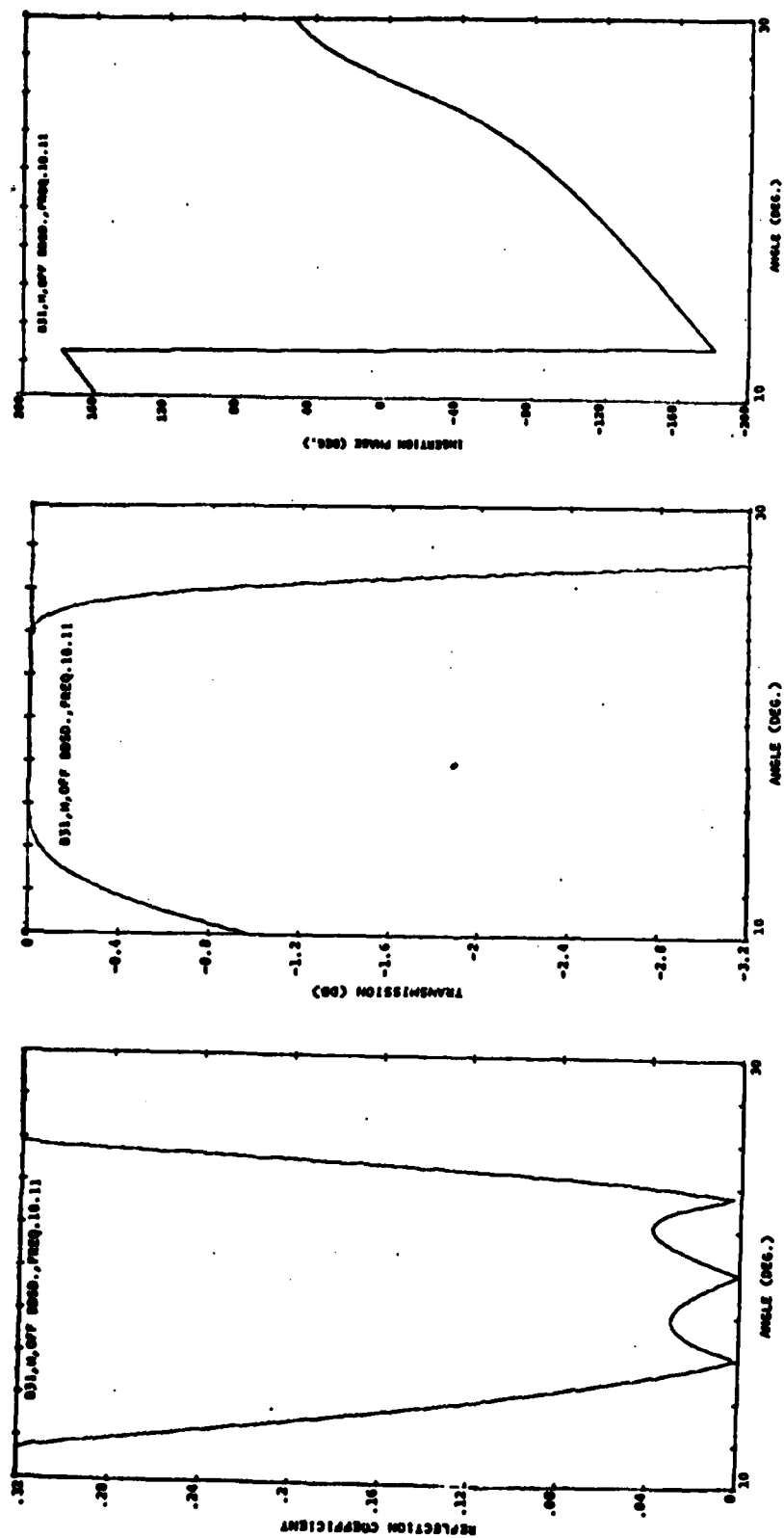


Figure A-98 Passband Reflection and Transmission, Filter B31° 20°, H Plane.

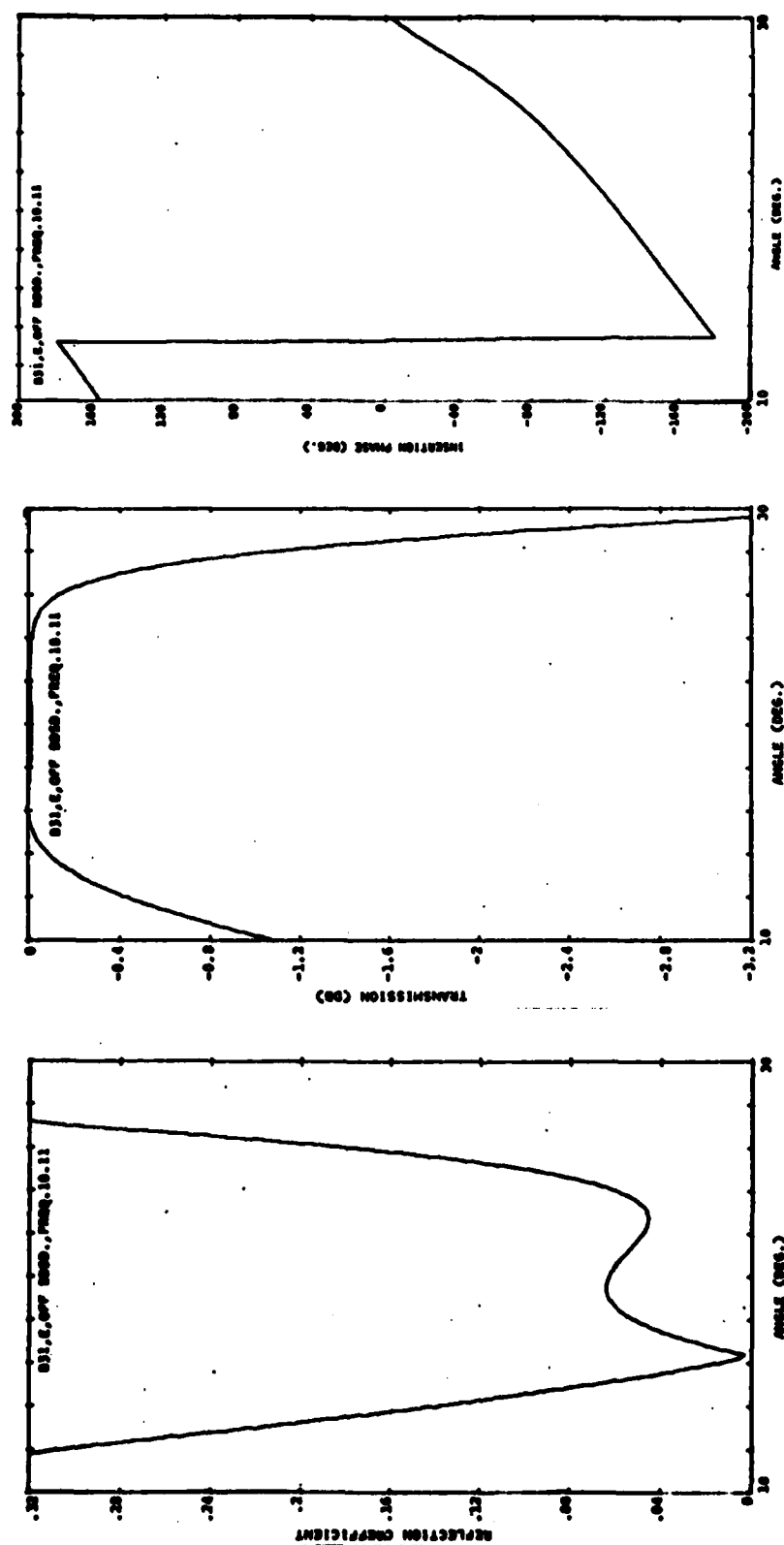


Figure A-99 Passband Reflection and Transmission, Filter B31° 20°, E Plane.

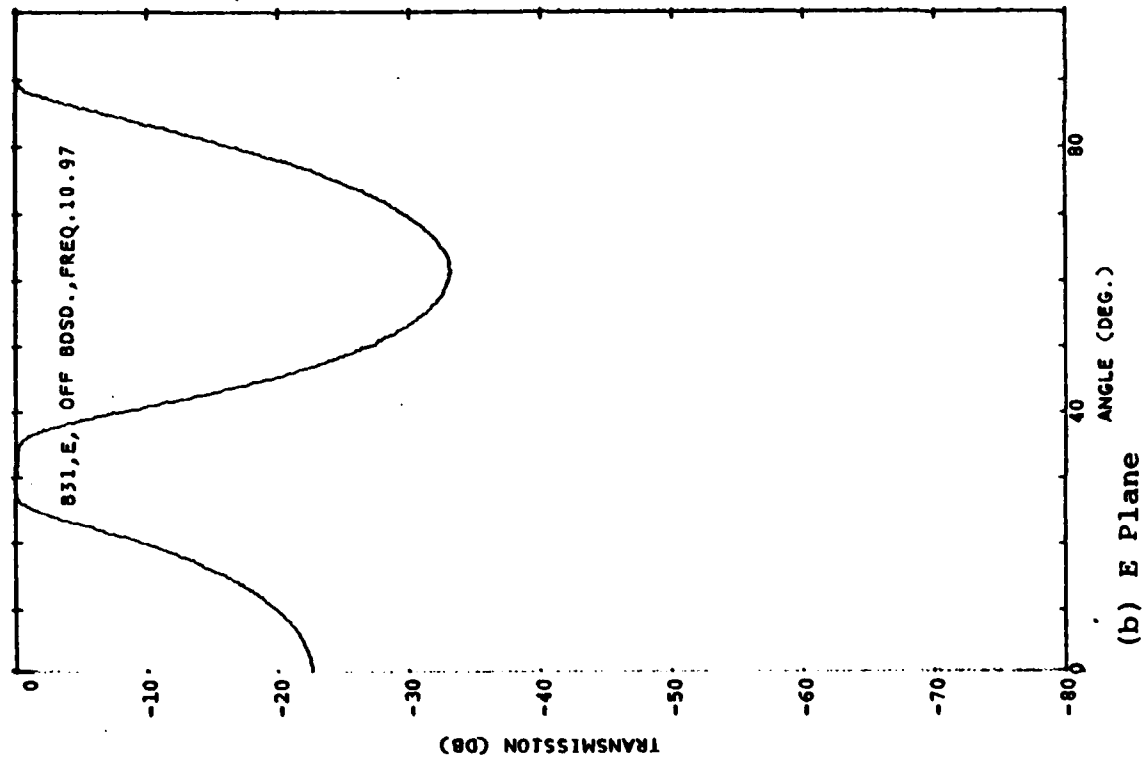
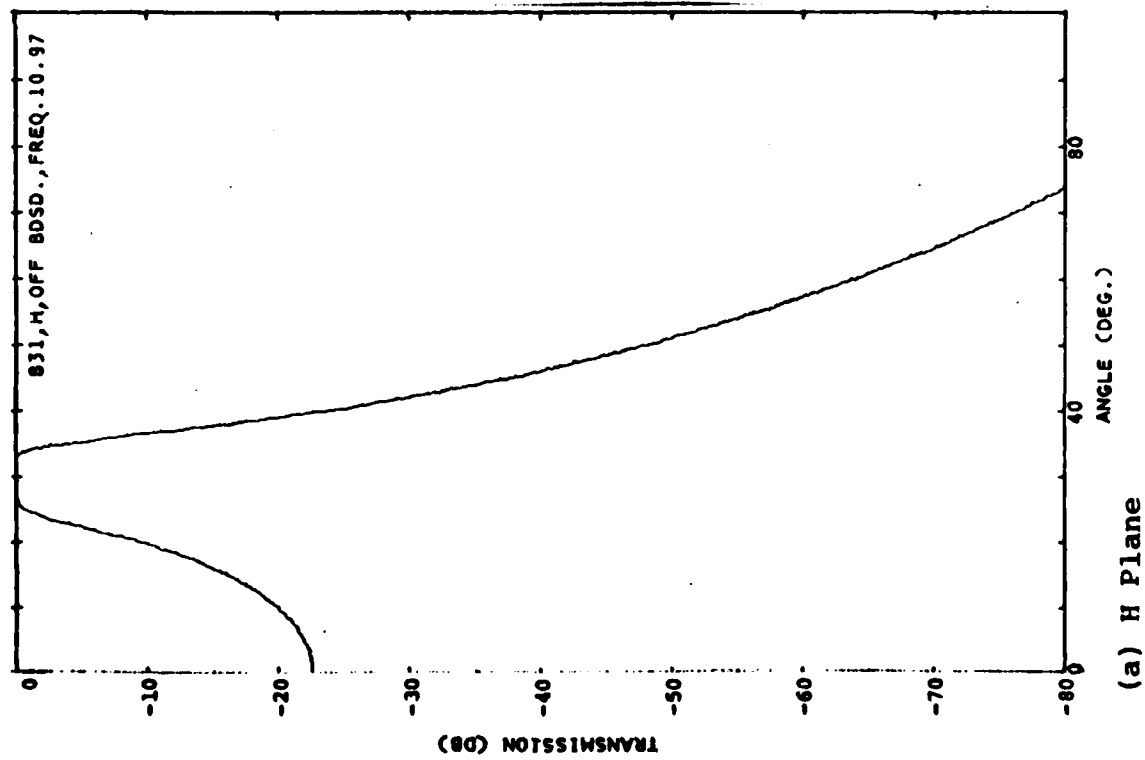


Figure A-100 Transmission, Filter B31"o" 30°, H and E Planes.

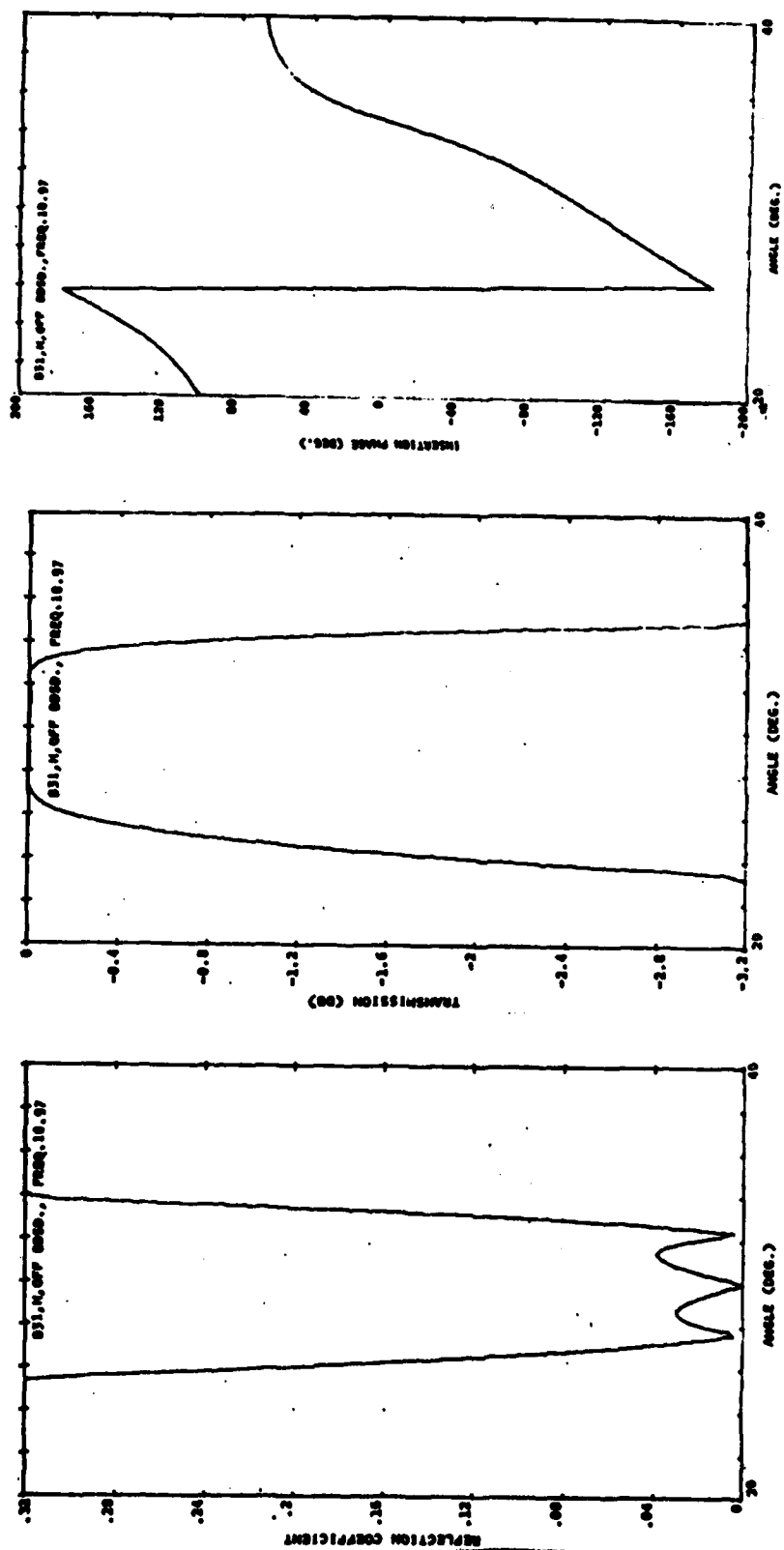


Figure A-101 Passband Reflection and Transmission, Filter B31"o" 30°, H Plane.

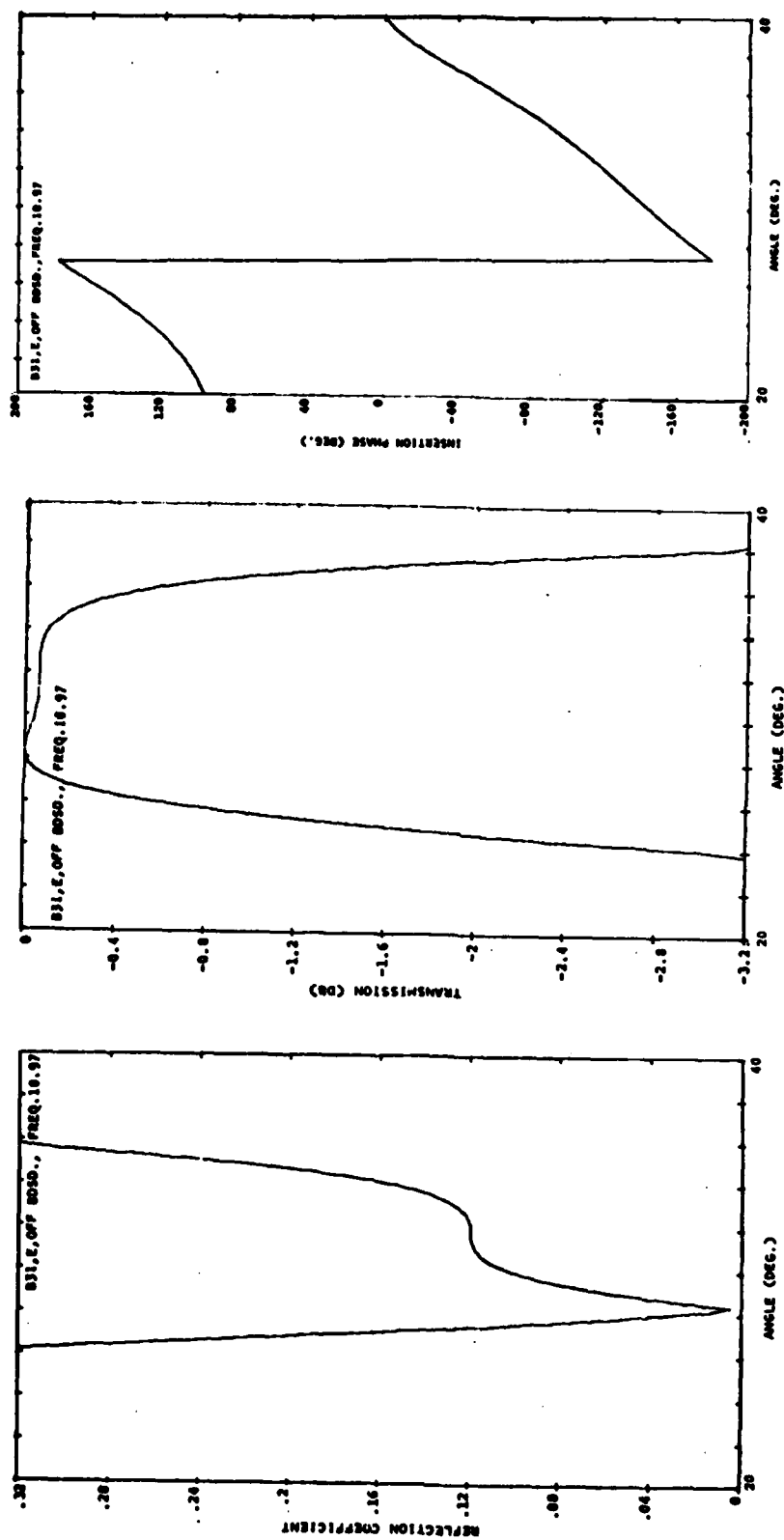


Figure A-102 Passband Reflection and Transmission, Filter B31"o" 30°, E Plane.

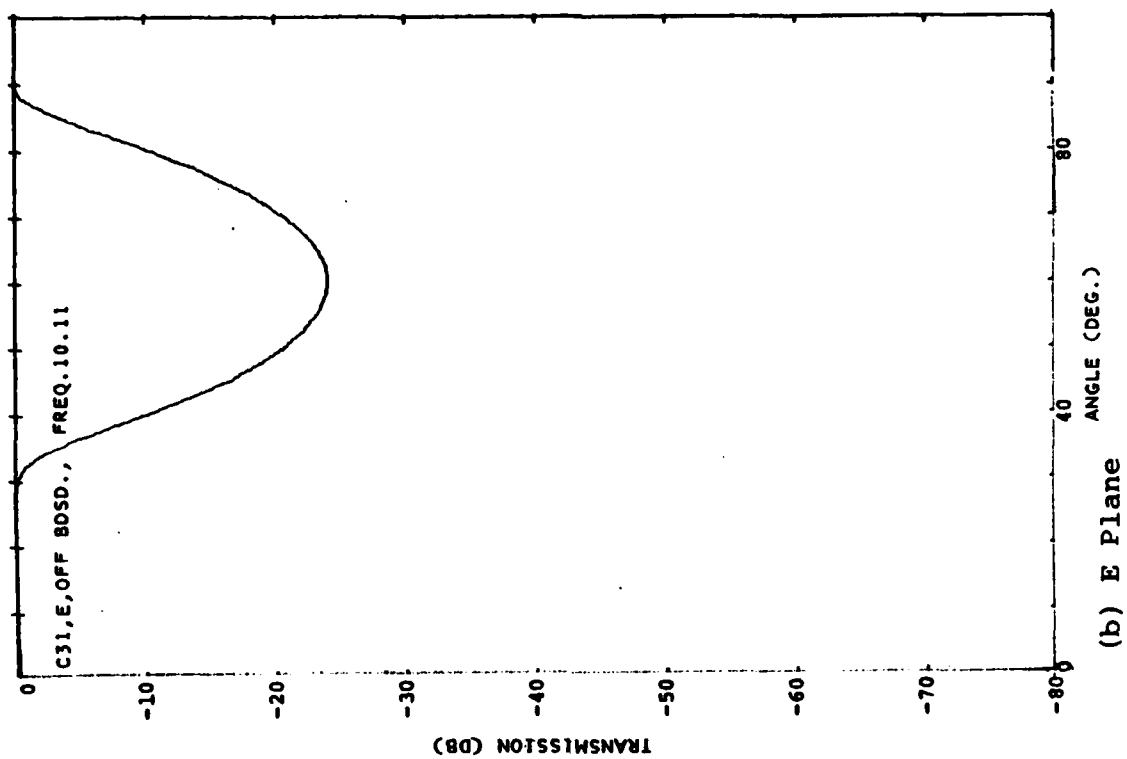
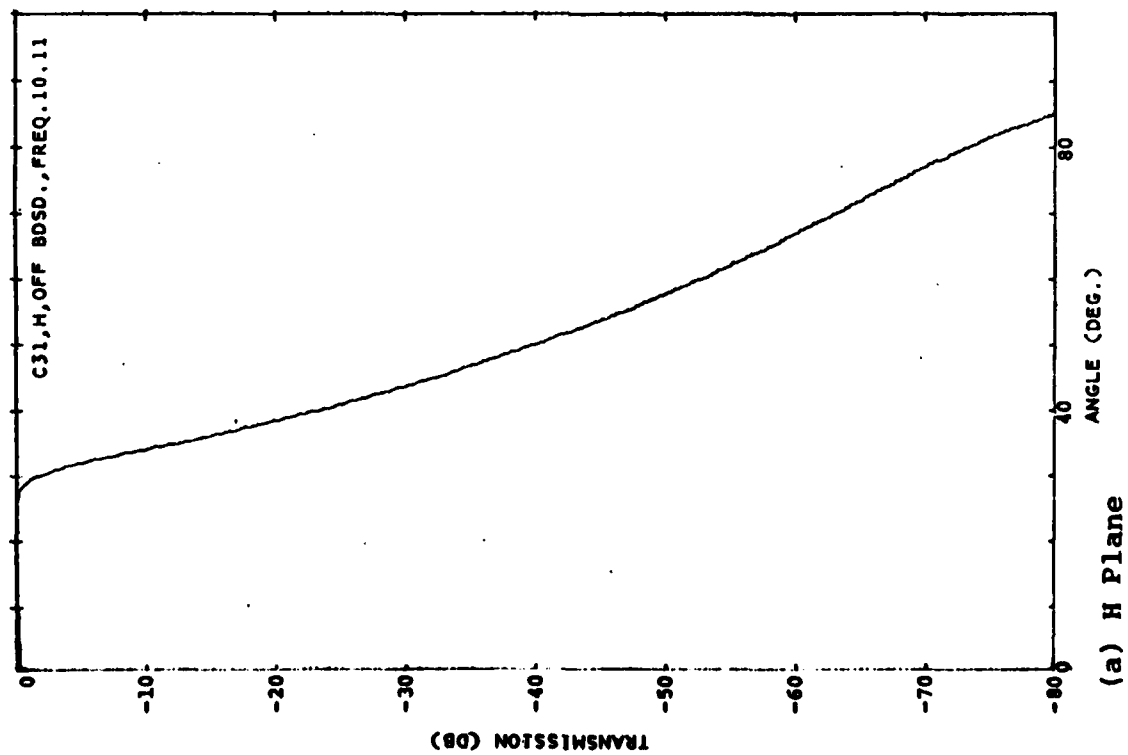


Figure A-103 Transmission, Filter C31"o" 20°, H and E Planes.

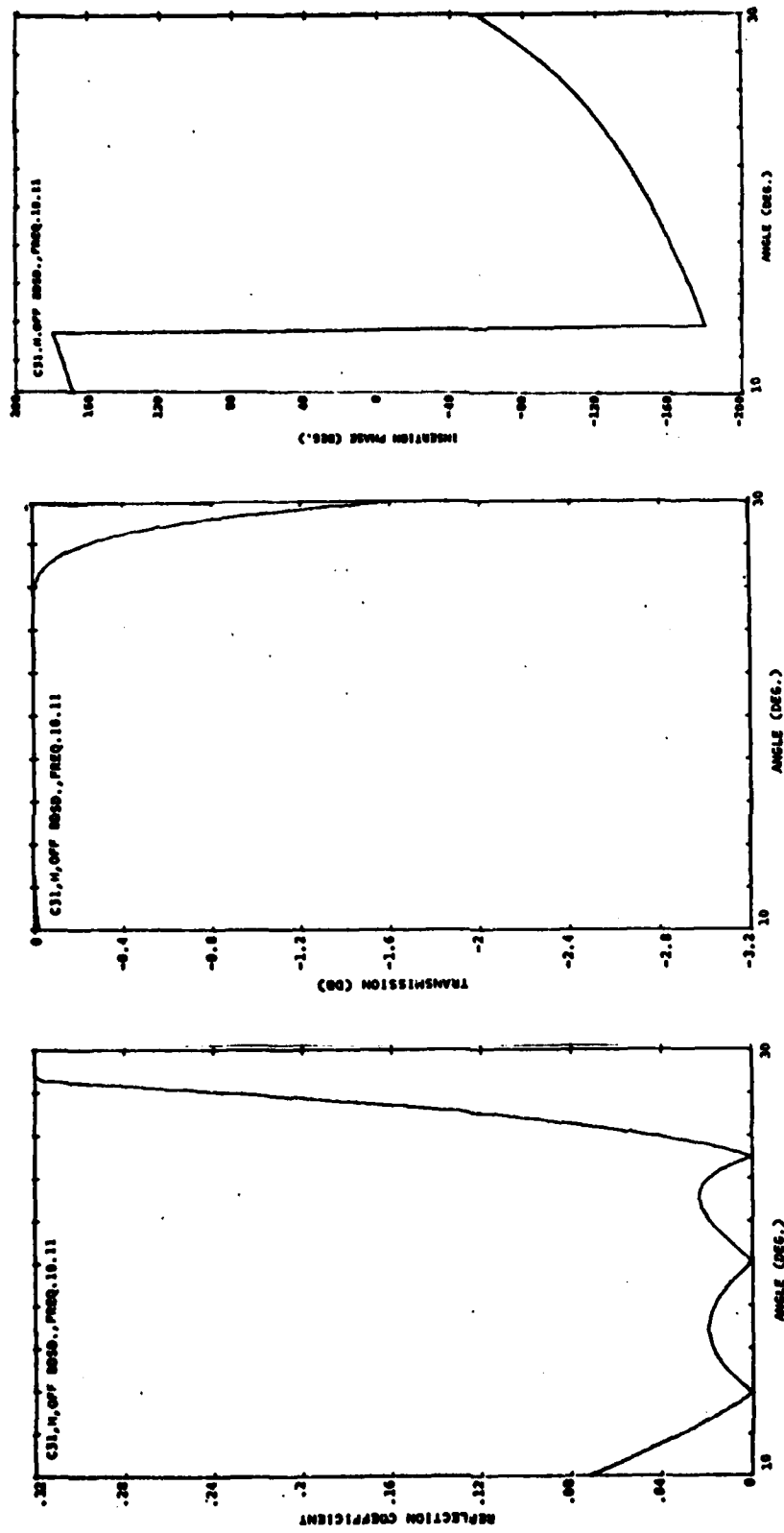


Figure A-104 Passband Reflection and Transmission, Filter C31"o" 20°, H Plane.

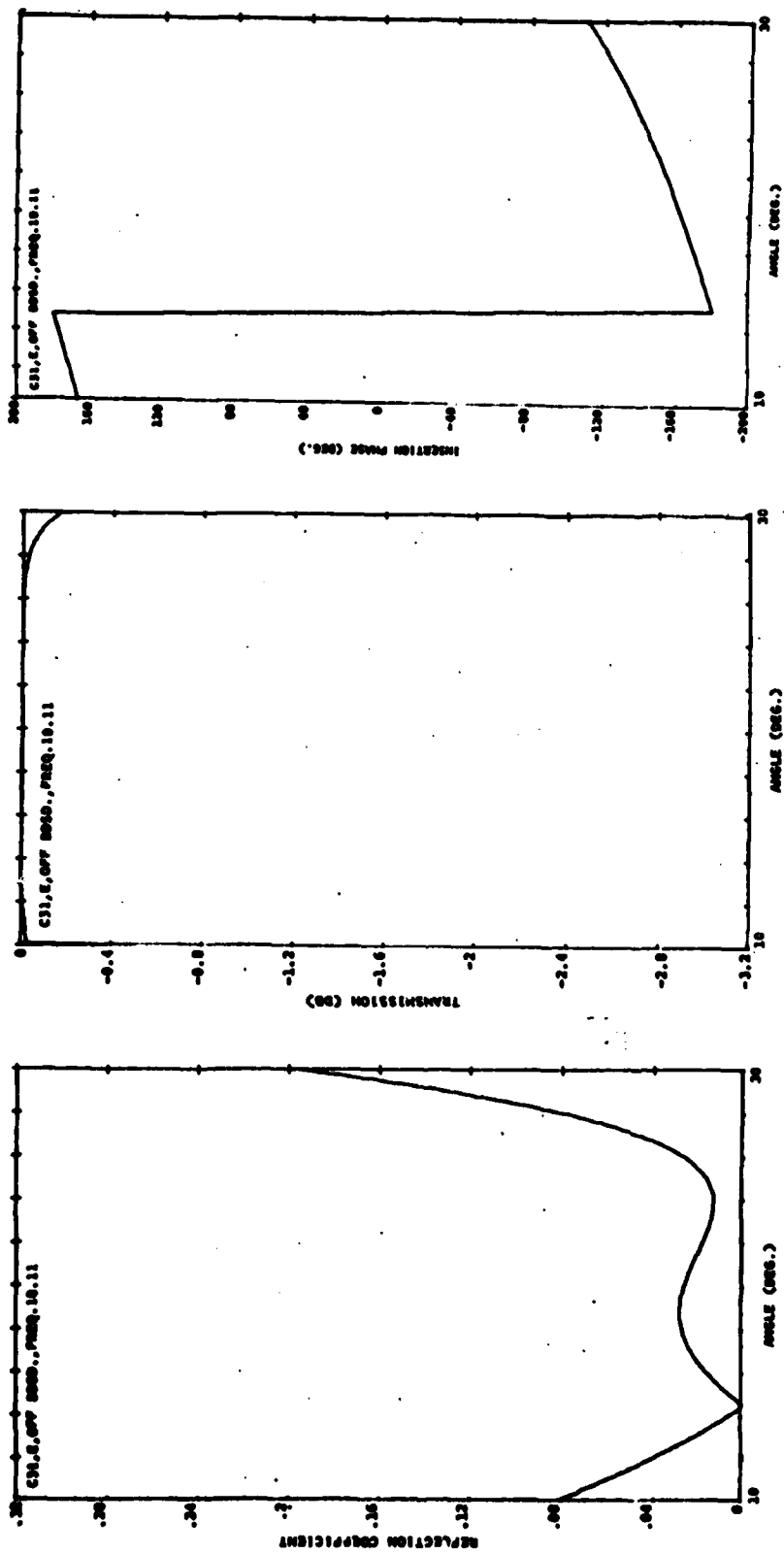
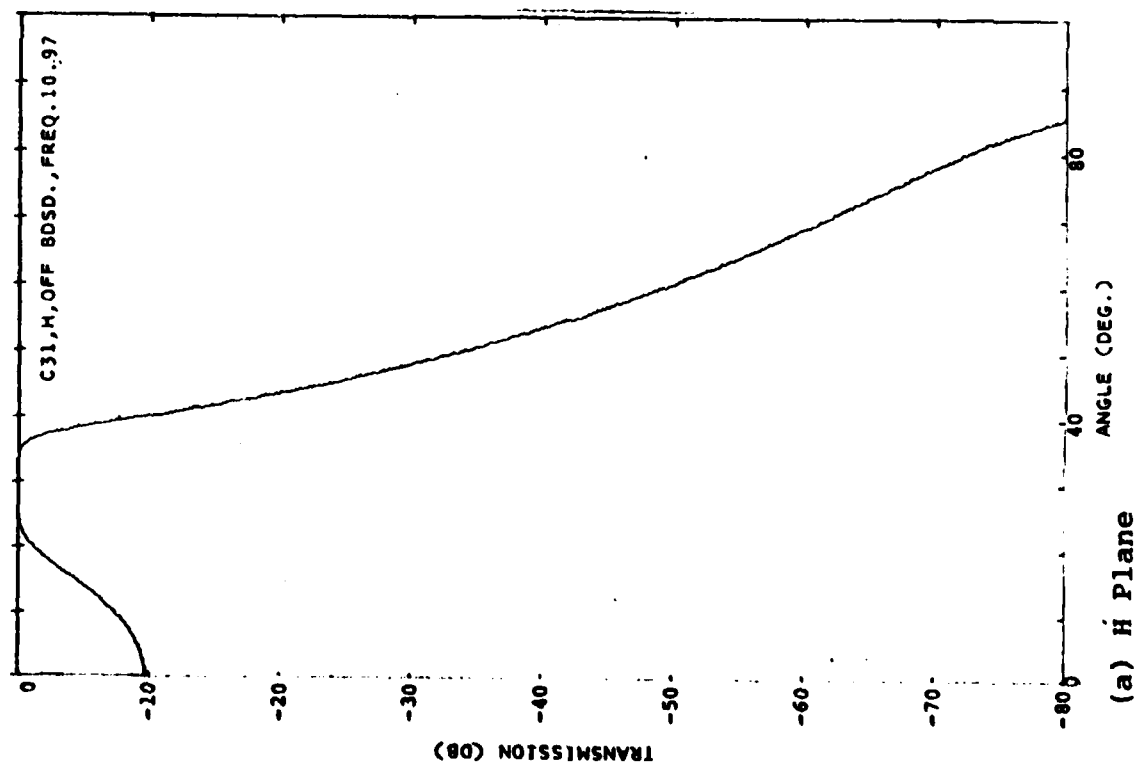
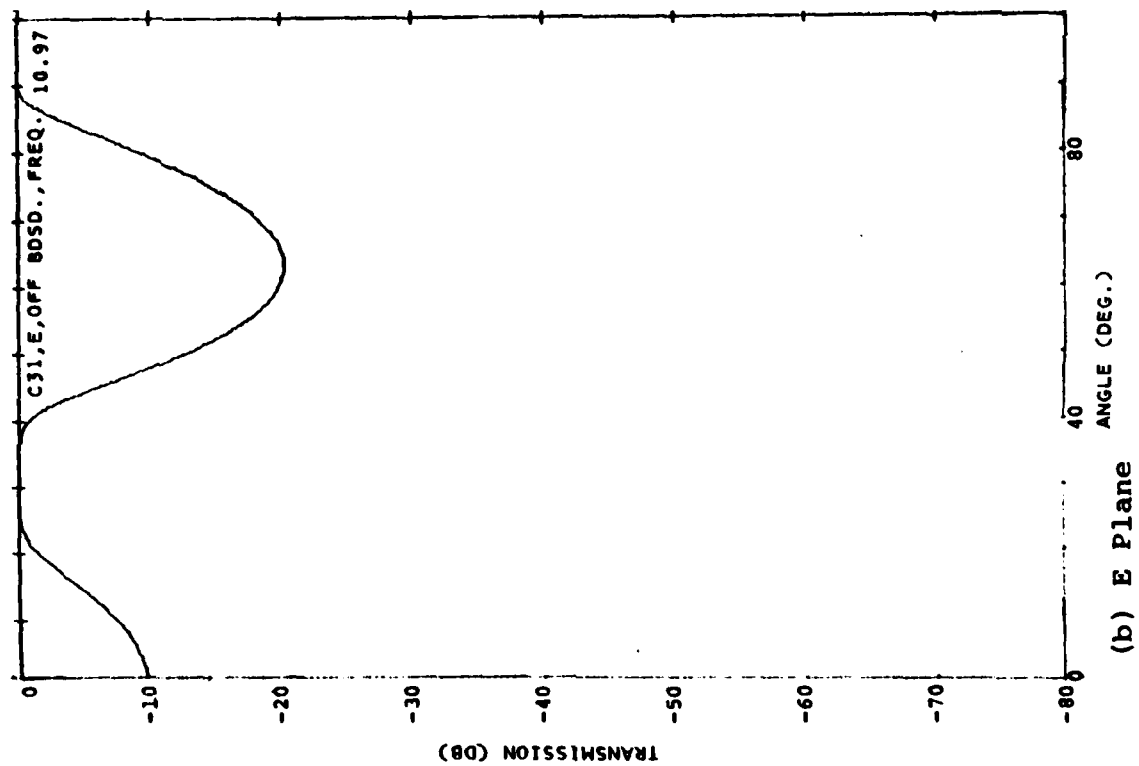


Figure A-105 Passband Reflection and Transmission, Filter C31"o" 20°, E Plane.



(a) H Plane



(b) E Plane

Figure A-106 Transmission, Filter C31 "o" 30°, H and E Planes.

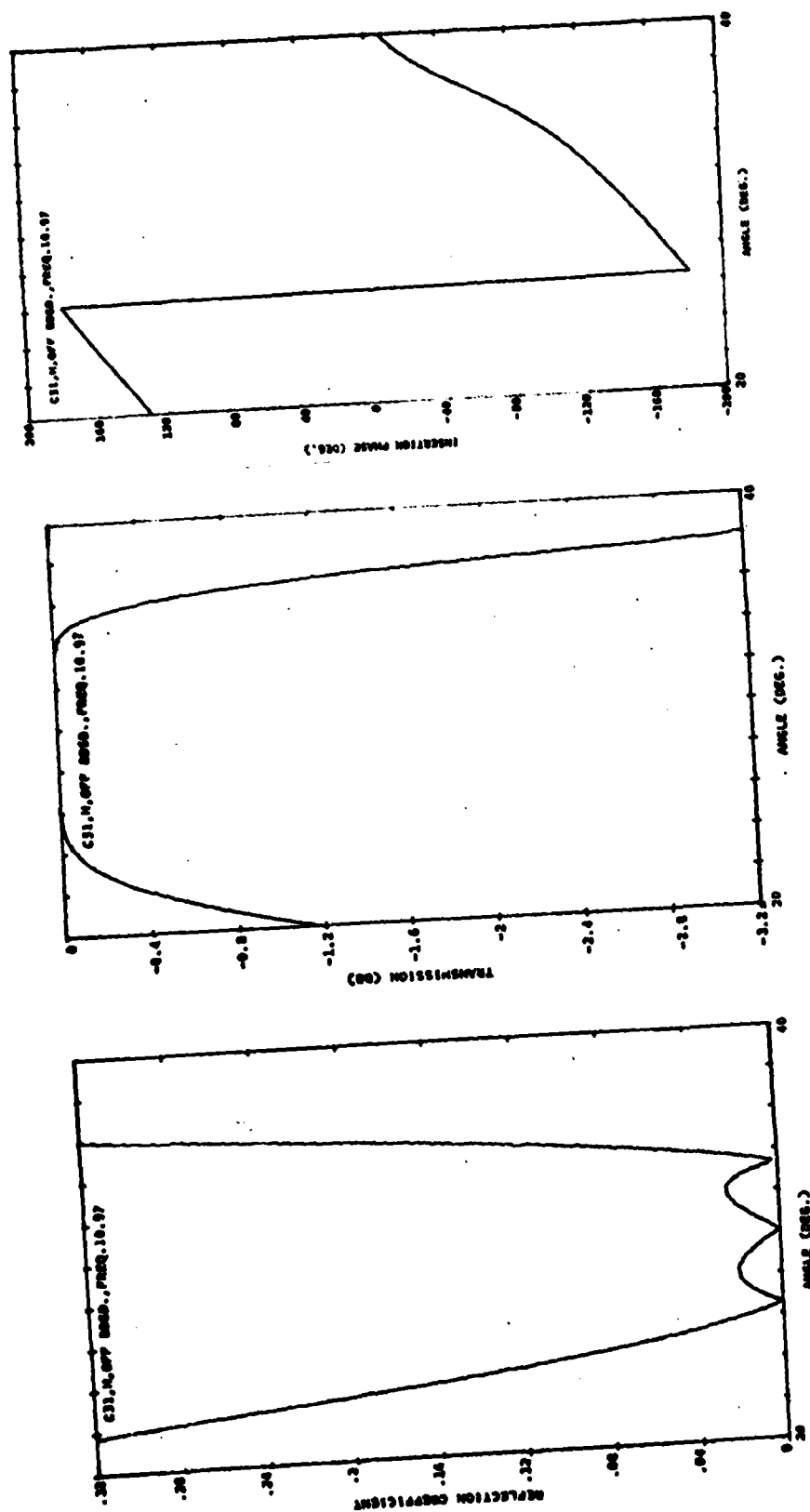


Figure A-107 Passband Reflection and Transmission, Filter C31 30°, H Plane.

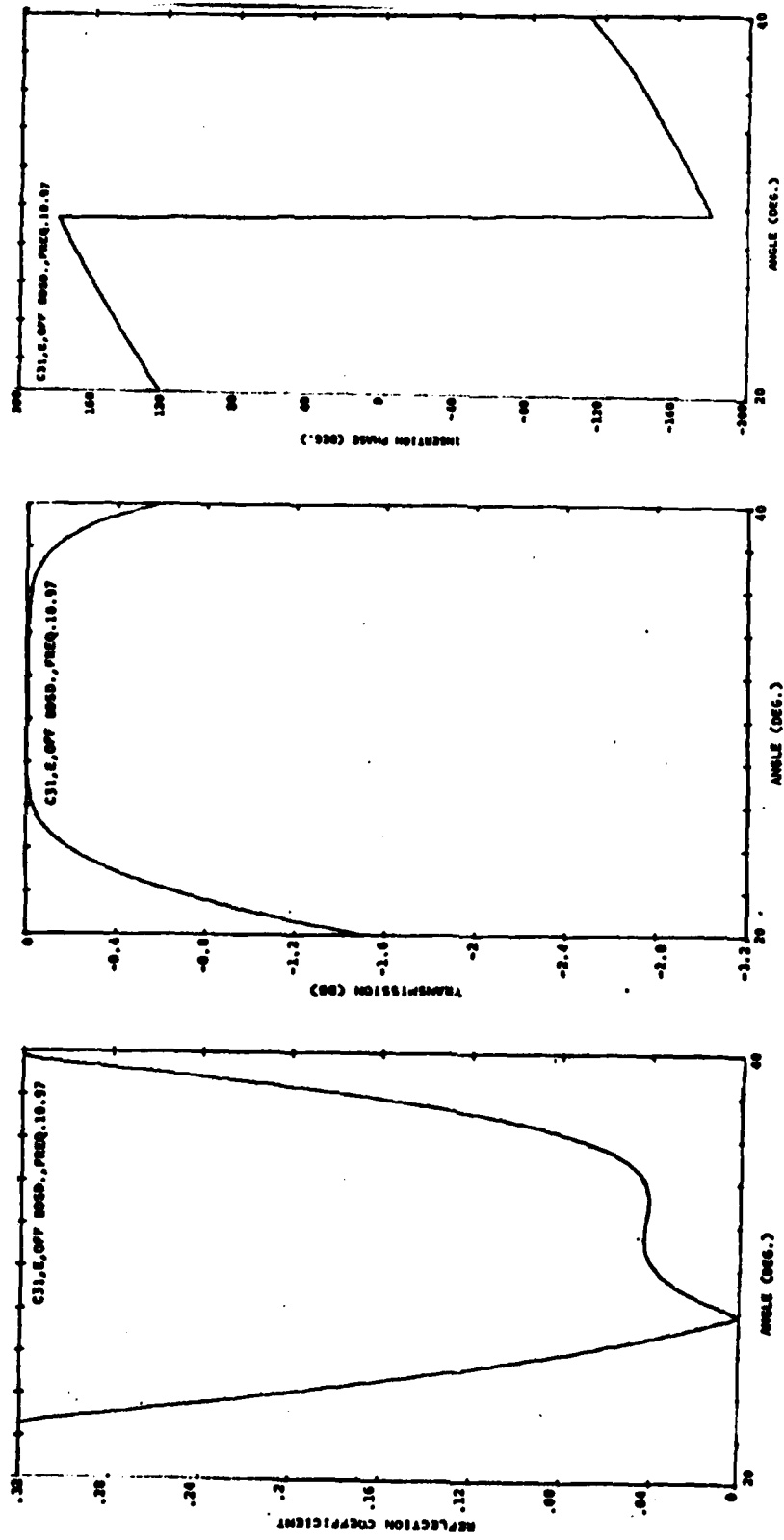


Figure A-108 Passband Reflection and Transmission, Filter C31° 30' E Plane.

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